#19

CONTRACT DOCUMENTS

AND

SPECIFICATIONS

FOR

CORTLAND COUNTY LANDFILL
REMEDIAL ACTION
LANDFILL CLOSURE

CONTRACT NO. 1A - GENERAL CONSTRUCTION

CORTLAND COUNTY LEGISLATURE
COUNTY OFFICE BUILDING
60 CENTRAL AVENUE
BOX 5590
CORTLAND, NEW YORK 13101

SEPTEMBER, 2000

PREPARED BY:

BARTON & LOGUIDICE, P.C.
CONSULTING ENGINEERS
290 ELWOOD DAVIS ROAD
BOX 3107
SYRACUSE, NEW YORK 13220

New Y...
Division of Environmental Remediation
Bureau of Construction Services

Approved
COMMISSIONER
P.E
16 Oct 2000

BIDDING & CONTRACT REQUIREMENTS

SECTION 00020

ADVERTISEMENT FOR BIDS

Sealed bids for the furnishing of all labor and material necessary for the Cortland County Landfill, Remedial Action Landfill Closure will be received by the office of the Clerk of the Cortland County Legislature, County Office Building, 60 Central Ave, P.O. Box 5590, Cortland, New York 13101 until 10:00 A.M. local time, October 31, 2000, at which time and place they will be publicly opened and read aloud. **There is a mandatory Pre-Bid Meeting scheduled for all Bidders at the project site on October 17, 2000 at 11:00 A.M., all Bidders must attend.**

Bids will be received for the following Contract(s):

Contract No. - 1A - General Construction

Contract Documents, including Advertisement For Bids, Information For Bidders, Wage Rates, Additional Instructions, Bid Documents, Agreement, General Conditions, General Requirements, Specifications, Contract Drawings and any Addenda, may be examined at no expense at the office of Barton & Loguidice, P.C., Consulting Engineers, 290 Elwood Davis Road, Liverpool, New York 13088, or at the Clerk of the Cortland County Legislature's Office. Copies of the Contract Documents may be obtained from Barton & Loguidice, P.C., upon deposit of Fifty Dollars ($50.00) for each set. Any bidder upon returning such set in good condition within thirty (30) days following the award of the Contract or the rejection of the bids will be refunded his payment. Deposits will not be refunded to any non-bidders. Checks only shall be made payable to the County of Cortland.

CASH DEPOSITS WILL NOT BE ACCEPTED. ALL HANDLING COSTS (MAIL, DELIVERY SERVICES, ETC.) SHALL BE THE RESPONSIBILITY OF THE BIDDER.

Each bid must be accompanied by security in an amount not less than five percentum (5%) of the amount of the bid in the form and subject to the conditions provided in the Information for Bidders. No Bidder may withdraw his bid within forty-five (45) days after the actual date of opening thereof.

This is an exempt capital improvement project, and Bidders shall not include in their bid sales and compensating use taxes on the cost of materials which are to be incorporated into the work and which are to be separately sold by the Contractor to the County of Cortland prior to incorporation into the work of the Contract.

SECTION 00020

ADVERTISEMENT FOR BIDS

This is a Title 3 Contract, therefore, the successful bidder as Contractor agrees to incorporate into any contract with subcontractors, contractual provisions applicable to record keeping, reporting, notice requirements and actions determined to be necessary by the Department to implement the requirements of the Minority/Women Business Enterprise-Equal Employment Opportunity (M/WBE-EEO) utilization plan, and of Executive Law Article 15-A, regulations promulgated thereunder, and other applicable law and regulations. Minority and Women Business Enterprise (M/WBE) goals are 12% MBE and 5% WBE as well as equal employment opportunity goals of 10% and 10%. Prior to contract award a M/WBE plan must be submitted to the Owner by the successful bidder.

The attention of Bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under this Contract.

The right is reserved to waive any informalities in the Bid and to reject any or all Bids.

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BIDDING & CONTRACT REQUIREMENTS

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BIDDING & CONTRACT REQUIREMENTS

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END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00100

INFORMATION FOR BIDDERS

00100.01 LOCATION OF THE WORK

The work for the Cortland County Landfill Remedial Action Landfill Closure, is located at the Cortland County Landfill, Town Line Road, McGraw, New York.

00100.02 DESCRIPTION OF THE WORK

The items of work under this Contract include, but are not necessarily limited to, the following:

Contract 1A - General Construction: shall include all related site work required to construct a NYCRR Part 360 cap over the Old County Landfill. This site work shall include, clearing of the site, construction of the capping system and the construction of surface water drainage swales as shown on the Contract Documents. Work shall also include removal and disposal into the existing old County Landfill of designated buried waste disposal areas and construction of a modified NYCRR Part 360 modified cap over the abandoned City landfill area. Also included is electrical work as follows: installation of approximately 235 L.F. of overhead 240/120 V - 1⌀ 200A cable and telephone lines including 3 support poles and installation of a holding tank alarm system and other related necessary items to furnish and complete an operational system.

The Owner would like to bring to the attention of all Bidders that the landfill footprint on the site has been classified as a Class 2 Inactive Hazardous Waste Site (Registry No. 510005) by the NYSDEC.

SECTION 00100

INFORMATION FOR BIDDERS

00100.03 COMMENCEMENT AND COMPLETION OF THE WORK

Upon execution of the Contract including delivery of the Performance Bond, Labor & Materials Payment Bond and insurance policies and certificates by the Contractor to the Owner and the approval thereof by the Owner's attorney, the Contractor will be notified to proceed with the work. Such notification will be in the form of a letter to proceed from the Engineer.

The Contractor shall give the Engineer at least five (5) days written notice of the date he intends to start work at the site.

Personnel involved with construction activities within the Exclusion Zone and the Decontamination Zone, as defined by the Health and Safety Plan, must be appropriately trained pursuant to 29 CFR 1910.120 (HAZWOPER). All Contractors must prepare and submit a Health & Safety Plan prepared by a Certified Industrial Hygenist. The appropriate level of training for others, for example, truck drivers making deliveries, will be determined by the Contractor's Health and Safety Administration.

All work items of the Contract shall be substantially completed by within 365 days of Notice to Award unless such period is extended by the Owner as provided herein.

00100.04 COLLATERAL WORK AND CONDITIONS OF WORK

Each Bidder shall inform himself fully of the conditions relating to the construction of the Project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder, as Contractor, of his obligation to furnish all material and labor necessary to carry out the provisions of his Contract. Insofar as possible, the Contractor, in carrying out the work, shall employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor. (See also Section 01012.01.)

Each Contractor will be required to coordinate his work with the work of other Contracts. Each Contractor will be required to adjust his schedule accordingly.

00100.05 RECEIPT & OPENING OF BIDS

The County of Cortland (herein called the Owner) invites Bids on the attached forms. Bids will be received by the Owner until the time and at the place stated in the attached Advertisement For Bids. Bids must be sealed in envelopes addressed to the Clerk of the

SECTION 00100

INFORMATION FOR BIDDERS

00100.05 RECEIPT & OPENING OF BIDS - Continued

Cortland County Legislature, County Office Building, 60 Central Avenue, P.O. Box 5590, Cortland, New York 13101. The outside of the envelope shall bear the name and address of the Bidder and shall be labeled to clearly show the Contract designation for which the Bid is submitted.

00100.06 INFORMALITIES, WAIVERS AND WITHDRAWALS

The Owner may consider informal any Bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities in or reject any or all Bids. Bids which do not contain a price for every numbered item contained in the Bid form will not be accepted.

Any Bid may be withdrawn prior to the scheduled deadline for receipt of Bids or authorized postponement thereof, but no Bid may be withdrawn within forty-five (45) days after the actual date of the opening thereof. Any Bid received after the time and date specified will not be considered, and will be returned unopened.

00100.07 BID PREPARATION

Unless otherwise noted thereon, all blanks on the Bid forms must be appropriately filled in with ink and with both words and figures, and the Bid must be properly executed. Do not remove the Bid forms from this binder.

All Contract Documents, except the Contract Drawings, the Performance Bond, Labor & Materials Payment Bond, Certificate of Insurance and any Addenda, are contained in this binder. The Contract Drawings are bound separately. All Contract Documents, except the Contract Drawings, Performance Bond and Labor & Materials Payment Bond, and Certificate of Insurance must be submitted with the Bid. The Contract Documents are defined in the Agreement. As part of the bid proposal the Contractor must submit an affidavit stating that they received all issued addenda.

SECTION 00100

INFORMATION FOR BIDDERS

00100.08 ADDENDA AND INTERPRETATIONS

No verbal interpretation of the intent of any of the Contract Documents will be made before receipt of Bids. Requests for interpretations prior to receipt of Bids must be presented in writing to the Engineer, Barton & Loguidice, P.C., Consulting Engineers, 290 Elwood Davis Road, Box 3107, Syracuse, New York 13220, and to be given consideration must be received by the Engineer at least seven (7) days prior to the date set for the opening of Bids.

Any interpretation, and any additional information or instruction will, if issued, be in the form of a written Addendum or Addenda sent by certified mail to all holders of Contract Documents at the addresses furnished therefor, at least five (5) days prior to the date of the opening of Bids. Facsimile ("fax") communication may be issued in advance of any written Addendum or Addenda without diminishing any part of this Section.

Failure of any Bidder to receive any such Addendum or interpretation shall not relieve such Bidder from any obligation under this Bid as submitted. All Addenda so issued shall become a part of the Contract Documents.

00100.09 QUALIFICATIONS OF BIDDERS

The Owner reserves the right to make such investigation as he may deem necessary or advisable to determine any Bidder's ability to do the work, and the Bidder shall furnish to the Owner on request all data and information pertinent thereto. The Owner reserves the right to reject any Bid if such investigation fails to satisfy the Owner that the Bidder is fully qualified to do the work.

Conditional Bids will be considered informal and will be rejected.

Immediately following the Canvass of Bids the Low Bidder, if so requested, shall furnish the Owner a sworn and notarized financial statement, and a statement of his qualifications and experience.

Bidders must demonstrate to the Owner that they have successfully completed at least one NYCRR Part 360 Landfill Cap Closure in the State of New York within the past five (5) years. A statement of site locations, and contact persons with phone numbers must be made available upon request for verification prior to award.

SECTION 00100

INFORMATION FOR BIDDERS

00100.10 OBLIGATIONS OF BIDDERS

At the time of the opening of Bids, each Bidder will be presumed to have inspected the Site, to have informed himself fully of the conditions relating to the work and labor required for the work, and to have read and acquainted himself with all the Contract Documents. Failure to do so will not relieve the Bidder who is awarded the Contract of his obligation to complete the work for the price or prices bid, or of any other obligation under the Contract. The failure or omission of any Bidder to receive or examine any Contract Documents shall in no way relieve him from any obligation in respect to his Bid.

00100.11 BID SECURITY

Each Bid must be accompanied by cash in United States currency or a certified check of the Bidder in an amount not less than five percent (5%) of the Bid. A Bid Bond, fully executed by the Bidder as principal, and having as surety thereon a surety company approved by the Owner and authorized to do business in New York State, will be accepted in lieu of cash or certified check. Checks should be made payable to the Owner.

Such cash, checks or Bid Bonds will be returned to all except the three lowest Bidders within three working days after the opening of Bids. The remaining deposits will be returned to the three lowest Bidders within three working days after execution of the Contract, or, if no Contract is executed within 45 calendar days after opening of Bids, upon demand of the Bidder at any time thereafter so long as he has not been notified of the acceptance of his Bid.

00100.12 LIQUIDATED DAMAGES FOR FAILURE TO EXECUTE CONTRACT

Should the successful Bidder refuse or fail to execute the Contract and Bond within five (5) working days after receipt of notice of the acceptance of his Bid, the security deposited with his Bid shall be forfeited to the Owner as liquidated damages for such refusal or failure.

00100.13 DISCREPANCY IN BIDS

In the event a discrepancy exists in any Bid between the prices written in words and the prices written in figures, the prices written in words shall govern. If a discrepancy exists in any bid between unit prices and the extended totals therefor, the unit prices shall govern. In either of the above cases, the extended totals, and the total of all extensions, shall be corrected, if necessary, and the Bid may not be considered informal.

SECTION 00100

INFORMATION FOR BIDDERS

00100.14 LOWEST BIDDER

Bids will be compared on the basis of the totals for the Contract, corrected as necessary in conformance with Article 00100.13, given at the bottom of the schedule of quantities, prices and extensions. Such total in each Bid shall be the sum of all lump sum prices, plus the sum of all the extensions produced by multiplying the unit price in each case by the corresponding listed quantity. The Contract will be awarded to the lowest responsive and responsible bidder. The Contract will be awarded within 45 days of the opening of the Bid.

All Bidders shall be advised that the lowest bid received from all Bidders on either Alternate 1 or Alternate 2 will be selected for the work. Bidders may or may not bid both alternates.

The Owner reserves the right to reject any and all Bids.

END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00150

WAGE RATES

00150.01 POSTING MINIMUM WAGE RATES & KEEPING RECORDS

The Contractor and every Subcontractor on public works contracts shall post in a prominent and accessible place on the Site a legible statement of all wage rates and supplements as specified in the Contract to be paid or provided, as the case may be, for the various classes of mechanics, workmen and laborers employed on the work.

The Contractor and every Subcontractor shall keep original payrolls or verified transcripts thereof showing the hours and days worked by each workman, mechanic or laborer, the occupation at which he worked, the hourly wage rate paid and the supplements paid or provided, on the Site, when the Contractor or Subcontractor maintains no regular place of business in New York State and where the amount of the Contract is in excess of $25,000. All other Contractors and Subcontractors shall produce within five days on the Site and upon formal order of the Commissioner of Labor or his designated representative such original payrolls or verified transcripts thereof, as may be deemed necessary to adequately enforce the provisions of this Section.

Notwithstanding the aforementioned requirements, every Contractor and Subcontractor shall submit to the Owner within thirty days after issuance of its first payroll, and every thirty days thereafter, a transcript of the original payroll record, as provided by Article 8 of the Labor Law, subscribed and affirmed as true under penalties of perjury. The original payrolls or transcripts shall be preserved for three years from the completion of the work.

00150.02 NON-DISCRIMINATION AND LABOR PRACTICES

In accordance with Section 220-e of Article 8 of the State Labor Law, the Contractor agrees:

A. That in the hiring of employees for the work of this Contract or any Subcontract, neither he nor any Subcontractor, nor any person acting on behalf of the Contractor, or any Subcontractor, shall by reasons of race, creed, color, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which his employment relates; and

SECTION 00150

WAGE RATES

00150.02 NON-DISCRIMINATION AND LABOR PRACTICES - Continued

B. That neither the Contractor, nor any Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this Contract on account of race, creed, color, sex, disability or national origin; and

C. That there may be deducted from the amount payable to the Contractor by the Owner, a penalty of Fifty Dollars for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of this Contract; and

D. That this Contract may be cancelled or terminated by the Owner, and all monies due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this Section of the Contract; and

E. That the aforesaid provisions of this Section covering contracts for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of New York.

F. During the performance of this Contract, the Contractor agrees as follows:

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

SECTION 00150

WAGE RATES

00150.02 NON-DISCRIMINATION AND LABOR PRACTICES - Continued

2. The Contractor will send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice to be provided by the State Division of Human Rights, advising such labor union or representative of the Contractor's agreement under subparagraphs (1) through (7) (hereinafter called "non-discrimination clauses"). If the Contractor was directed to do so by the contracting agency as part of the Bid or negotiation of this Contract, the Contractor shall request such labor union or representative to furnish him with a written statement that such labor union or representative either will affirmatively cooperate, within the limits of its legal and contractual authority, in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment, employment and the terms and conditions of employment under this Contract shall be in accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the Contractor shall promptly notify the State Division of Human Rights of such failure or refusal.

3. The Contractor will post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Division of Human Rights setting forth the substance of the provisions of subparagraphs (1) and (2) and such provisions of the State's laws against discrimination as the State Commissioner of Human Rights shall determine.

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

SECTION 00150

WAGE RATES

00150.02 NON-DISCRIMINATION AND LABOR PRACTICES - Continued

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

6. This Contract may be forthwith cancelled, terminated or suspended, in whole or in part, by the contracting agency upon the basis of a finding made by the State Commissioner of Human Rights that the Contractor has not complied with these non-discrimination clauses, and the Contractor may be declared ineligible for future contracts made by or on behalf of the State or a public authority or agency of the State, until he satisfies the State Commissioner of Human Rights that he has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such finding shall be made by the State Commissioner of Human Rights after conciliation efforts by the State Division of Human Rights have failed to achieve compliance with these non-discrimination clauses and after verified complaint has been filed with the State Division of Human Rights, notice thereof has been given to the Contractor and an opportunity has been afforded him to be heard publicly before the State Commissioner of Human Rights or his designee. Such sanctions may be imposed and remedies otherwise provided by law.

7. The Contractor will include the provisions of sub-paragraph (1) through (7) of this paragraph A and in every Subcontract or purchase order in such a manner that such provisions will be binding upon each Subcontractor or vendor as to operations to be performed within the State of New York. The Contractor will take such action in enforcing such provisions of such Subcontract or purchase order as the contracting agency may direct, including sanctions or remedies for non-compliance. If the Contractor becomes involved in or is threatened with litigation with a Subcontractor or vendor as a result of such direction by the

SECTION 00150

WAGE RATES

00150.02 NON-DISCRIMINATION AND LABOR PRACTICES - Continued

contracting agency, the Contractor shall promptly so notify the Attorney General, requesting him to intervene and protect the interest of the State of New York.

G. It is hereby agreed that all applicable provisions of the Labor Law of the State of New York shall be carried out in the performance of this Contract.

H. This agreement shall be void and of no effect unless the Contractor shall secure compensation insurance for the benefit of, and keep insured during the life of this agreement, such employees engaged therein as are required to be insured by the provisions of the Worker's Compensation Law of the State of New York.

00150.03 LEGAL DAY'S WORK

In accordance with Section 220 (2) of Article 8 of the State Labor Law, no laborer, workman or mechanic employed by the Contractor, a Subcontractor or other person doing or contracting to do any part of the work shall be permitted or required to work more than eight hours in any one calendar day or more than five days in any week except in cases of extraordinary emergency including fire, flood or danger to life or property, or in case of national emergency when so proclaimed by the President of the United States. To work other than a normal 8 hour work day 5 days/week requires prior approval of the County and the New York State Department of Labor.

00150.04 WAGE RATES

In accordance with Section 220 of Article 8 of the State Labor Law, the wages to be paid for a legal day's work, as hereinbefore defined, to laborers, workmen or mechanics employed by the Contractor or Subcontractors, shall be not less than the prevailing rate of wages as hereinafter defined. Each laborer, workman or mechanic employed by the Contractor, Subcontractors, or other person upon or about the work, shall be paid not less than the wages and supplements herein provided.

Any person or corporation that willfully pays or provides less than the stipulated wage scale or supplements shall be guilty of a misdemeanor and upon conviction shall be punished as provided by law.

SECTION 00150

WAGE RATES

00150.04 WAGE RATES - Continued

It shall be the duty of the Commissioner of Labor, or, if the Owner is a city, the comptroller or other analogous officer of such city, to make a determination of the schedule of wages to be paid all laborers, workmen and mechanics employed on the Project (if it is a public works project) including supplements for welfare, pension, vacation and other benefits. These supplements include hospital, surgical or medical insurance or benefits, life insurance or death benefits, accidental death or dismemberment insurance, and pension or retirement benefits. If the amount of supplements provided by the employer is less than the total supplements shown on the wage schedule, the difference shall be paid in cash to employees.

The supplements to be provided shall be in accordance with prevailing practices in the locality. The amount for wages and for supplements listed in the schedule in these Contract Documents does not necessarily include all types of prevailing wages and supplements in the locality, and a future determination by the Commissioner of Labor may require the Contractor to pay increased wages or provide additional supplements.

00150.05 VERIFICATION OF AMOUNTS DUE FOR WAGES AND SUPPLEMENTS

In accordance with Section 220-a of Article 8 of the State Labor Law, the New York State schedule of prevailing wages and supplements, as included in this Contract or as subsequently redetermined by the New York State Department of Labor, shall be specifically included in each and every Subcontract, regardless of tier, awarded by the Contractor or his Subcontractors.

Subcontractors, regardless of tier, shall provide to the Contractor a verified statement attesting that the Subcontractor has received and reviewed the prevailing wage rate and supplement schedule and agreeing that it will pay its employees the applicable wages and will pay or provide the supplements specified therein. The Contractor shall submit to the Owner copies of all such verified statements.

The Owner will not make final payment to the Contractor unless and until the Contractor submits the following:

- verified statements as described in the preceding paragraph

SECTION 00150

WAGE RATES

00150.05 VERIFICATION OF AMOUNTS DUE FOR WAGES AND SUPPLEMENTS - Continued

- certification to the amounts then due from the Contractor to any and all laborers for wages or supplements on account of labor performed upon the work under the Contract

- certification to the amounts then due from any Subcontractor, regardless of tier, for wages and supplements, on account of labor performed upon the work under the Contract, or shall certify that the Contractor has no knowledge of such amounts owing to or on behalf of any laborers of its Subcontractors.

In the event it is determined by the New York State Commissioner of Labor that the wages and/or supplements of any employees of the Contractor's Subcontractors, regardless of tier, have not been paid or provided pursuant to the appropriate schedule of wages and supplements, the Contractor shall be responsible for payment of such wages or supplements.

00150.06 MINIMUM RATES

New York State Department of Labor wage rates will be in effect on this Project.

The minimum wage rates designated by the Commissioner of Labor of the State of New York are attached. These minimum rates and supplements may be modified during the life of the Contract. If the prevailing wage rates should subsequently be legally modified or increased by any means other than by the action of the Owner, the Contractor shall assume full responsibility for the payment of said increases without recourse to the Owner.

END OF SECTION

STATE OF NEW YORK DEPARTMENT OF LABOR
BUREAU OF PUBLIC WORK
STATE OFFICE BUILDING CAMPUS
ALBANY, N.Y. 12240

SCHEDULE 2000A

DATE: 08/16/2000

CORTLAND CO. DEPT.SOL.WAS

DOUGLAS A. MILLER, P.E.
BARTON & LOGUIDICE, P.C.
290 ELWOOD DAVIS ROAD
BOX 3107
SYRACUSE NY 13220

PRC 0000128 CORTLAND COUNTY 01

Location and Type of Project
PROJECT ID #: NONE
OLD CORTLAND CO. LANDFILL
REMEDIAL ACTION
LANDFILL CLOSURE,TOWNLINE ROAD, T/O SOLON,NY

Attached is an Addendum to the schedule of wage rates and supplements for the above project. These rates supersede any previous rates issued to you by the Bureau of Public Work for such job classifications on any projects in the counties indicated on this schedule.

This schedule is effective from July 1, 2000 through June 30, 2001. Each July 1st you will automatically be forwarded a new updated schedule until we are notified that the project has been completed or canceled.

The attached rates are based on the latest information available to the Department of Labor, Bureau of Public Work. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the Public Work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the District office located nearest the project or visit our WEB site at www.labor.state.ny.us for the most current wage schdules.

NOTE: A 1997 AMENDMENT TO SECTION 220 OF THE LABOR LAW REQUIRES THE DEPT. OF JURISDICTION TO RECEIVE AND MAINTAIN MONTHLY TRANSCRIPTS OF CERTIFIED PAYROLL RECORDS FOR THREE YEARS FROM THE DATE OF COMPLETION OF THE WORK IN THE AWARDED CONTRACT.

Very truly yours,

Kevin E. Jones
DIRECTOR

NOTICE TO CONTRACTING AGENCIES:

Upon cancellation or completion of this project, enter the necessary information and return this page to the Bureau of Public Work, SOBC, Bldg. 12, Rm. 130, Albany, NY 12240

PROJECT HAS BEEN COMPLETED/CANCELED:

DATE _____

SIGNATURE _____

TITLE _____

For additional information, contact the following District Offices;

Albany (518) 457-2744
Binghamton (607) 721-8005
Buffalo (716) 847-7159
Hempstead (516) 485-4878
New York City (212) 352-6088
Syracuse (315) 428-4056
Rochester (716) 258-4505
Utica (315) 793-2314
White Plains (914) 997-9507

PW-200.1 (7-00)

Prevailing Rate Schedule

New York State Department of Labor

Case Number

0000128
CORTLAND 2000A

INSTRUCTIONS

PREVAILING RATE SCHEDULE INFORMATION

The information listed below is provided to assist you in the interpretation of particular requirements, for each classification of worker, contained in the attached Schedule of Prevailing Rates.

PAID HOLIDAYS

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work.
Note: If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

SUPPLEMENTAL BENEFITS

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is for each hour worked, some classifications require the payment or provision of supplements for each hour paid (this may include paid holidays on which no work is performed) and/or may require supplements to be paid or provided at a premium rate for premium hours worked.

EFFECTIVE DATES

When you review the schedule for a particular trade or occupation, your attention should be directed to the date above the column(s) of rates. This is the date on which the rate become effective. The rate listed is valid until the next effective rate change or until the new annual determination, which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. The department of jurisdiction is required to provide a copy of the current annual determination. Should you have questions, please contact the Bureau of Public Work or visit the NYS Department of Labor's Web site at www.labor.state.ny.us for current wage rate information.

WORKERS COMPENSATION

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage under the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

-Contractor to be awarded contract must provide proof of Workers' Compensation coverage prior to being allowed to begin work.

-The policy of insurance must be issued by a company authorized to provide Workers' Compensation coverage in this state.

-Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certififcate holder.

-If New York State coverage is added to an existing out of state policy, it can only be added to a policy of a company authorized to write Workers' Compensation coverage in this state, and the coverage must be listed under item 3A of the information page.

-The contract must maintain proof that subcontractors doing work covered under this contract secure and maintain a Workers' Compensation policy for all employees working in New York State.

If you have any questions concerning the attached schedule or would like additional information, please contact nearest BUREAU of PUBLIC WORK District Office or write to the NEW YORK STATE DEPARTMENT of LABOR, BUREAU of PUBLIC WORK, BUILDING 12, STATE OFFICE BUILDING CAMPUS, ALBANY, NEW YORK 12240.

District Office Locations:	Telephone#	FAX #
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Hempstead	516-485-4878	516-485-0322
Bureau of Public Work - Rochester	716-258-4505	716-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2342
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - New York City	212-352-6088	212-352-6186
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

(7/06/99)

OVERTIME . .

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule.
Additional requirements may also be listed in the OVERTIME section.

(A) Time and one half of the hourly rate after 7 hours per day.
(AA) Time and one half of the hourly rate after 7 and one half hours per day.
(B) Time and one half of the hourly rate after 8 hours per day.
(B1) Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday. Double the hourly rate for all additional hours.
(C) Double the hourly rate after 7 hours per day.
(C1) Double the hourly rate after 7 and one half hours per day.
(D) Double the hourly rate after 8 hours per day.
(D1) Double the hourly rate after 9 hours per day.
(E) Time and one half of the hourly rate on Saturday.
(E1) Time and one half 1st 4 hours on Saturday. Double the hourly rate all additional Saturday hours.
(E2) Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather.
(E3) Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that weekdue to inclement weather, provided a given employee has worked between 16 and 32 hours that week.
(E4) Saturday and Sunday may be used as a make-up day at straight time

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when a day is lost during that week due to inclement weather.
(F) Time and one half of the hourly rate on Saturday and Sunday.
(G) Time and one half of the hourly rate on Saturday and Holidays.
(H) Time and one half of the hourly rate on Saturday, Sunday, and Holidays.
(I) Time and one half of the hourly rate on Sunday.
(J) Time and one half of the hourly rate on Sunday and Holidays.
(K) Time and one half of the hourly rate on Holidays.
(L) Double the hourly rate on Saturday.
(M) Double the hourly rate on Saturday and Sunday.
(N) Double the hourly rate on Saturday and Holidays.
(O) Double the hourly rate on Saturday, Sunday, and Holidays.
(P) Double the hourly rate on Sunday.
(Q) Double the hourly rate on Sunday and Holidays.
(R) Double the hourly rate on Holidays.
(S) Two and one half times the hourly rate for Holidays, if worked.
(S1) Two and one half times the hourly rate the first 8 hours on Sunday or Hoilidays. One and one half times the hourly rate all additional hours.
(T) Triple the hourly rate for Holidays, if worked.
(U) Four times the hourly rate for Holidays, if worked.
(V) Including benefits at SAME PREMIUM as shown for overtime.
(W) Time and one half for benefits on all overtime hours.
NOTE: BENEFITS are PER HOUR WORKED, for each hour worked, unless otherwise noted

HOLIDAYS

PAID

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work.
Note: If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

(1) None.
(2) Labor Day.
(3) Memorial Day and Labor Day.
(4) Memorial Day and July 4th.
(5) Memorial Day, July 4th, and Labor Day.
(6) New Year's Day, Thanksgiving Day, and Christmas Day.
(7) Lincoln's Birthday, Washington's Birthday, and Veterans Day.
(8) Good Friday.
(9) Lincoln's Birthday.
(10) Washington's Birthday.
(11) Columbus Day.
(12) Election Day.

(13) Presidential Election Day.
(14) 1/2 Day on Presidential Election Day.
(15) Veterans Day.
(16) Day after Thanksgiving Day.
(17) July 4th.
(18) 1/2 Day before Christmas Day.
(19) 1/2 Day before New Years Day.
(20) Thanksgiving Day.
(21) New Year's Day.
(22) Christmas Day.
(23) Day before Christmas.
(24) Day before New Year's Day.
(25) Presidents' Day.
(26) Martin Luther King, Jr. Day.

ASBESTOS WORKER

WAGES(per hour)

	7/01/2000
Asbestos Worker Insulation Work (On mechanical systems only)	$21.48

OVERTIME PAY: See (B1, Q) on OVERTIME PAGE
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (4, 6) on HOLIDAY PAGE. Triple time for LABOR DAY if worked.

APPRENTICES: (1) yr terms at the following percentage of Journeyman'swage.

1st yr	2nd	3rd	4th
40%+$1.00	50%+$1.00	70%	80%
$9.59	$11.74	$15.03	$17.18

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman.....	$9.69
APPRENTICES	9.69

THE FOLLOWING RATES APPLY TO WORK ON: SCHOOLS,HOSPITALS,NURSING HOMES,HEALTH CARE FACILITIES,PUBLIC HOUSING,OFFICE BUILDINGS,HOTELS AND MOTELS,EXCLUDING UNDERGROUND WORK,STAND ALONE STEAM AND ELECTRIC GENERATION PLANTS ASSOCIATED WITH THESE FACILITIES.

_WAGES(per hour)

JOURNEYMAN.....	$17.28
APPRENTICES:	
1ST YEAR.....	9.59
2ND YEAR.....	11.74

SUPPLEMENTAL BENEFITS:(per hour worked)

JOURNEYMAN.....	$6.69
APPRENTICES.....	6.69

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ASBESTOS WORKER
WAGES(per hour)

	7/01/2000
Asbestos Worker Removal & Abatement Only *.....	$18.42

* On Mechanical Devices NOT to be scrapped.

OVERTIME PAY: See (B, E2, H) ON OVERTIME PAGE.
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE.
Overtime: See (5, 6) on HOLIDAY PAGE.

SUPPLEMENTAL BENEFITS:(per hour worked)

$6.50

1-202.1B

BOILERMAKER
WAGES(per hour)

	7/01/2000
Boilermaker.....	$23.00

OVERTIME PAY:New Work See (B,E,Q) on OVERTIME PAGE. Time & 1/2 for the 9th & 10th hours Monday thru Saturday,double all addtl.hours.
OVERTIME PAY:Maint. See (B,E,Q) on OVERTIME PAGE
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 10, 11, 15) on HOLIDAY PAGE

APPRENTICES: (1/2) year terms at the following percentage of Journeyman's wage.

1st	2nd	3rd	4th	5th	6th	7th	8th
65%	65%	70%	75%	80%	85%	90%	95%

SUPPLEMENTAL BENEFITS:(per hour worked) *NOTE See below

Journeyman... $ 8.02 Plus 13% of gross wage

*Note (Supplemental benefits per hour paid)

Journeyman...$ 4.00

Apprentice	Per hrs worked	Per hrs Paid
1st year.	$ 6.64 + 13% of wage	$ 2.62
2nd year..		
1st 6 months	6.84 + 13% of wage	2.82
2nd 6 months	7.04 + 13% of wage	3.02

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3rd year..		
1st 6 months	7.24 + 13% of wage	3.22
2nd 6 months	7.44 + 13% of wage	3.42
4th year..		
1st 6 months	7.64 + 13% of wage	3.62
2nd 6 months	7.84 + 13% of wage	3.82

No.6-175

CARPENTER

WAGES(per hour)

7/01/2000

Building:	
Carpenter.....	$19.24
Floor,Carpet layer...	$19.24
Dry-Wall Applicator..	$19.24
Lather.....	$19.24
Millwright.....	$20.24
Piledriver (Bldg)....	$20.24

OVERTIME PAY: See (B, E*, Q) on OVERTIME PAGE
*Double time after 8 hours on Saturday.
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (4,20,21,23) on HOLIDAY PAGE

APPRENTICE: (1/2) year terms at the following percentage of Journeyman's wage.

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	50%	60%	60%	70%	70%	80%	80%

SUPPLEMENTAL BENEFITS:(per hour worked See *Note below)

Appr. 1st and 2nd term	$3.31
Appr. 3rd thru 6th term	$4.81
Appr. 7th thru 8th.....	$5.41

Journeyman $7.505 *Note

*Note: Following portions of amount listed to be paid for each hour paid.

Journeyman - $ 2.10, Appr. 3rd thru 6 term- $ .60 ; Appr 7th thru 8th $1.20

603b

ELEVATOR

WAGES(per hour)

7/01/2000

Elevator Constructor...	$25.13
" Helper ..	$17.59

OVERTIME PAY: See (D, O, T) on OVERTIME PAGE
HOLIDAYS:
Paid: See (5, 6, 16) on HOLIDAY PAGE

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Overtime: See (5, 6, 16) on HOLIDAY PAGE
SUPPLEMENTAL BENEFITS:(per hour worked)

$ 6.935 plus
6 % of wage

No. 6-62.1
GLAZIER

WAGES(per hour)

6/01/2000

Glazier.....$ 18.31
" over 35 ft above ground*
*Addit.$.50 per hr.

OVERTIME PAY:See (B,E,E2,Q) on OVERTIME PAGE.
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE.
Overtime: See (5, 6) on HOLIDAY PAGE.

APPRENTICES: (1/2) year terms at the following percentage of journeyman's wage.

1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th	10th
40%	45%	50%	55%	60%	65%	70%	75%	80%	85%

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman & ALL Apprentices $ 5.41

5-677.B

LABORER

***If a prime contract is let for site work only, meaning no buildings are involved in their site contract, the heavy/highway rates would be applicable for the laborers classification only.

When a prime contract is let for site work and building excavation is part of that contract, the building rates would be applicable for the laborers classification.

Building Laborer:
Group #1: Basic Laborer.
Group #2: Pneumatic Tools.
Group #3: Blaster, Asbestos/Toxic Waste Work

WAGES(per hour)

7/01/2000

Building Laborer:
Group # 1..... $ 16.03
Group # 2..... 16.33
Group # 3..... 17.03

OVERTIME PAY: See (B,E,Q) on OVERTIME PAGE
HOLIDAYS:

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Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

SUPPLEMENTAL BENEFITS:(per hour worked)

$ 7.70

6-589

MASON - Building

WAGES(per hour) 5/01/2000

Brick/Block Layer..... $ 18.40
Cement/Stone Mason.... 18.40
Plasterer/EFIS..... 18.40
Tuck Pointer..... 18.40
An additional $7.50 per day for work on swing scaffolds, bosun chairs or other unsecured electrical or manually operated scaffold.

OVERTIME PAY: See (B,E*,Q) on OVERTIME PAGE * Double time after 8 hrs on Saturday.

HOLIDAY:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

APPRENTICES: (1/2) yr terms at the following percentage of journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	50%	65%	65%	75%	75%	90%	90%

SUPPLEMENTAL BENEFITS:(per hour paid)

$ 9.20

WAGES(per hour)	6/01/2000	6/01/2001 ADDITL.	6/01/2002 ADDITL.
Tile,Marble,Terrazo Wkr	$19.65	$0.90	$1.00
Tile Finisher.....	16.41	0.90	1.00

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAY:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

APPRENTICES:

Tile worker:(1 yr) terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th
50%	65%	75%	90%

Tile Finisher: (6month) terms at the following wage rate.

55%	67%	80%	93%

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SUPPLEMENTAL BENEFITS: (per hour worked)

	6/01/2000
Tile Worker: Journeyman.....	$ 7.20
Appr 50%	.40
Appr 65%.....	3.30
Appr 75% thru 90%.....	7.20
Tile Finisher: Journeyman.....	6.00
Appr 55% thru 67%.....	.30
Appr 80%.....	3.20
Appr 93%.....	6.00

6-17

ROOFER

WAGES(per hour)

	7/01/2000	6/01/2001
Roofer,Waterproofer..	$ 19.65	addl.$.75

*Addtl. $.75 per hr. for Pitch removal & application.
*Addtl. $.75 per hr. for asbestos abatement.

OVERTIME PAY: See (B, E, *,Q) on OVERTIME PAGE *
* Saturday may be paid at straight time if it is the 5th day worked. But if a holiday falls in that week Saturday will be paid at 1 1/2 times the rate.

HOLIDAY:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

APPRENTICES: (500) hour terms at the following percentage of journeyman's wage.

1st 500hrs	2nd 500hrs	3rd 1000 to 2000	4th 2000 to 3000	5th 3000 to 4000	6th	7th	8th
$9.82	9.82	11.79	13.75	15.72			

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman	$ 7.72
Appr 1st thru 4th terms	4.52
Appr 5th thru 6th terms	6.72
Appr 7th thru 8th terms	7.72

6-195

SHEETMETAL WORKER

WAGES(per hour)

	7/01/2000
Sheetmetal Worker:	
*(under $5 million)..	$ 21.66
*(over $ 5 million)..	22.66

*For total cost of Sheetmetal contract only.

OVERTIME PAY: See (B, E, Q*) on OVERTIME PAGE
*National Holidays Only.

HOLIDAY:

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

APPRENTICES: (1/2)year terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
40%	45%	50%	55%	60%	65%	70%	75%	80%	85%

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman	$10.395	
Appr 1st thru 3rd year	6.41 plus 3% of both wage and	$ 5.78
Appr 4th & 5th year	7.41 plus 3% of both wage and	6.78

6-58

SPRINKLER FITTER

WAGES(per hour)

	7/01/2000
Sprinkler Fitter.....$	23.65

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE.
HOLIDAY:
Paid: See (1) on HOLIDAY PAGE.
Overtime: See (5, 6) on HOLIDAY PAGE.

APPRENTICES: (1/2) year terms at the following percentage of Journeyman;s wage.

1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.
40%	45%	50%	55%	60%	65%	70%	75%	80%	85%

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman	$ 7.95
Apprs. 1st thru 4th term	4.10
All other terms	7.95

No. 1-669

TEAMSTER-Building

Truck Driver (Building):
GROUP 1: Warehousemen, Yardmen, Truck Helpers, Pickups, Panel Trucks, Flatboy Material Trucks(straight jobs), Single Axel Dump Trucks, Dumpsters, Material Checkers and Receivers, Greasers, Truck Tiremen, Mechanics Helpers and Parts Chasers.
GROUP 2: Tandems and Batch Trucks, Mechanics .
GROUP 3: Semi-Trailers, Low-boy Trucks, Asphalt Distribitor Trucks, and Agitator, Mixer Trucks and dumpcrete type vehicles, Truck Mechanic, Fuel Trucks.
GROUP 4: Specialized Earth Moving Equipment, Euclid type, or similar off-highway,where not self-loading, Straddle (Ross) Carrier, and self-contained concrete mobile truck.

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GROUP 5: Off-highway Tandem Back-Dump, Twin Engin Equipment and Double-Hitched Equipment where not self-loading.

WAGES(per hour) 7/01/2000

Building:
Groups #1 thru #4..... $16.89
Group #5..... 16.89

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAY:
Paid: See (5, 6, 15) on HOLIDAY PAGE
Overtime: See (5,6,15) on HOLIDAY PAGE
SUPPLEMENTAL BENEFITS:(per hour worked)

7/01/2000	1/01/2001
$ 6.07	$6.28

6-317AB

SURVEY CREW - Building

SURVEY CLASSIFICATIONS:
Party Chief- One who directs a survey party.
Instrumentman- One who runs the instrument and assists the Party Chief.
Rodman- One who holds the rods and in general, assists the survey party.

WAGES:(per hour)	7/01/2000	6/01/2001
Survey Rates-Building:		
Party Chief.....	$21.50	$22.00
Inst. Man/Rodperson	18.06	18.51
Grade checker.....	18.06	18.51

Additional 2.00 per hr. if work requires Level A, B or C of Personal Protective Equipment listed in the Occup. Saf. & Health Guidance Manual for Hazardous waste site activities. Paper dust masks are excluded from coverage in this section.

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE.
HOLIDAY:
Paid: See (5, 6) on HOLIDAY PAGE.
Overtime: See (5, 6) on HOLIDAY PAGE.

APPRENTICES: (1000) hour terms at the following percentage of Journeyman's wage.

1st 1000 hours	$13.55	$13.88
2nd 1000 hours	15.35	15.73
3rd 1000 hours	17.15	17.58

SUPPLEMENTAL BENEFITS: (per hour paid)

Journeymen	$10.85	$11.40
Appr 1st	5.50	5.85
Appr 2nd	7.10	7.55
Appr 3rd	8.35	8.90

POWER EQUIPMENT OPERATOR - BUILDING

Building:
CLASS # A: Air Plako, Asphalt and Blacktop Roller, Automated Concrete Spreader (CMI or equiv), Automated Fine Grade Machine (CMI), Backhoe, Belt Placer, Blacktop Spreader(such as Barber Greene & Blaw Knox), Blacktop Plant (automated), Blast or Rotary Drill(Truck or cat mounted), Boom Truck, Cableway, Caisson Auger, Scraper, Central Mix Plant (Automated),Cherry Picker-over(15)ton capacity, Concrete pump, Crane, Crusher - Rock, Derrick, Diesel Power Unit, Dragline, Dredge, Dual Drum Paver, Elevating Grader(self-propelled or towed), Elevator Hoist- Two Cage, Excavator-All purpose-hydraulically operated, Fork Lift (Loed/Lull Rough Terrain type), Front End Loader(4c.y. and over), Gradall, Grader (Power), Head Tower (Saurman or equal), Hoist (2 or 3 Drum), Hydroblaster (Laser Pump) (LCM's) work Boat Operator, Light Plants, compressors and generators, Locomotive, Maintenance Engineer, Maintenance Welder, Mine Hoist, Mucking Machine or Mole, Overhead Crane-Fixed/Permanent, Pile Driver, Quarry Master or Equivalent, Refrigeration Equip.-For Soil Stabilization, Sea Mule, Shovel, Side Boom. Slip Form Paver, Straddle Buggy (Ross Carrier, Lumber Carrier), Tractor Drawn Belt Type Loader(Euclid Loader), Trenching Machine (digging capacity of over 4 ft.depth), Truck Crane Operator, Truck or Trailer mounted log chipper(self-feeder), Tug operator(Manned, rented equip. excluded), Tunnel Shovel, Vibro or Sonic Hammer Controls(when not mounted in proximity to Rig Operator) Dewatering press, Burning plant operator, Barrel shredder.

CLASS B: "A" Frame Truck, Blacktop Plant(non-automatic), Boring Machine, Bulldozer, Cage-Hoist, Central Mix Plant(non-automated), Cherry Picker(15)tons and under, Compressor when used in battery of not more than five, Concrete Paver(single drum over 16S), Core Boring Machine, Drill Rigs-Tractor mounted, Elevator-as a material hoist, Fork Lift(other than Loed/Lull rough terr)w or w/o attach, Front End Loader(under 4 c.y.) Gunite Machine, High Pressure Boiler(15 lbs. & Over),Hoist(one drum),Hydraulic Breaking Hammer (Drop Hammer), Kolman Plant Loader (screening gravel), Maintenance Grease Man, Mixer for stabilized base-self-propelled (Seaman Mixer), Monorail Machine, Parapet Concrete or Pavemt Grinder, Post Hole Digger (truck or tractor mtd), Power Sweeper(Wayne or similar), Group Pump, Pump-Crete or Squeeze-Crete, Skid Steer Bobcat type loader, Road Widener(front end of Grader or self propelled), Roller, Shell Winder (motorized), Snorkel(over head arms), Snowblower controlman, Trenching Machine (digging capapcity of 4 ft. or less), Tugger Hoist, Vibro-tamp, Well Drill, Well Point System (Submersible pumps used in lieu of well point system), Winch(Motor driven), Winch truck, self-contained Hydraulic Bench Drill, Parts man and Vacuum mach. (self prop. or mtd.)Winch Cat

CLASS C: Compressor (Up to 500 c.f.), Concrete Paver or Mixer (under 16S),Concrete Pavement Spreaders and Finishers (not automated), Conveyor (over 12 ft), Electric Submersible Pump (4" and over), Farm Tractor with or without accessories, Fine Grade Machine (not automated), Fireman, Form Tamper, Generator(2,500 watts and over) Hydraulic Pump, Mechical Heaters - More than two(2) Mechanical Heaters or any Mechanical Heater or Heaters whose combined output exceeds 640,000 BTU per hour (manufacturer's rating) plus one self contained heating unit (i.e. Sundog or Air Heat type, New Holland Hay Dryer type excluded), Mulching Machine, Oiler, Post Driver(Truck or Tractor Mounted), Power Driven Welding Machine-300 amp.and over(other than all electric)one Welding Machine under 300 amp. won't require engineer unless in battery, Power Heater(hay dryer), Pump(all water & trash), Revinus Widener(rd widener), Single Light Plant, Steam Cleaner or Jenny, Tractor w or w/out towed access, Winch Cat

WAGES(per hour)	7/ 1/2000	6/01/2001

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Building:		
Master Mechanic.....	$22.94	$23.44
Asst.Master Mechanic	22.00	22.50
Class # A.....	21.50	22.00
Class # B.....	20.03	20.48
Class # C.....	17.21	17.41
Ple Dr. w/8m/Ld 100ft+	22.50	23.00
Tower Crane	22.50	23.00
Crane/Derrick w/boom:		
" 150 ft and over...	22.50	23.00
" 200 ft.....	23.50	24.00
" 300 ft.....	24.50	25.00

ALL LATTICE BOOM CRANES 65 TON CAPACITY AND OVER - CLASS A RATE PLUS $1.00
ALL HYDRAULIC CRANES 65 TON TO 79 TON CAPACITY - CLASS A RATE PLUS $.35
ALL HYDRAULIC CRANES 80 TON TO 99 TON CAPACITY - CLASS A RATE PLUS $.50
ALL HYDRAULIC CRANES 100 TON CAPACITY AND OVER - CLASS A RATE PLUS $1.00

ADDITIONAL $2.00 per hr. if work requires Level A,B,C of Personal Protective Equipment listed in the Occup. Saf. & Health Guidance Manual for Hazard. Wst. Site Activities. Paper dust masks are excluded from coverage in this section.

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAY:
Paid: See (5 , 6) on holiday page
Overtime: (5 , 6) on holiday page

APPRENTICS: (1000) HOUR TERMS AT THE FOLLOWING PERCENTAGE OF JOURNEYMAN'S WAGE.

1st	2nd	3rd	4th
60% of class A	65% of class A	70% of class A	80% of class A

SUPPLEMENTAL BENEFITS: (per hour paid)

journeyman	$10.85	$11.40	
appr 1st	5.50	5.85	
appr 2nd	7.10	7.55	
appr 3rd	7.40	7.95	
appr 4th	8.35	8.90	6-545b

LINEMAN LINEMAN/ELECTRIC

WAGES(per hour)

	7/01/1999	4/30/2000
Lineman/Tech./Welder	$29.17	29.85
Dynamite/Cable splicer	29.17	29.85
Digging Mach.....	26.25	26.87
Tract Trlr Driver.....	24.79	25.37
Truck Dr/Groundman.....	23.34	23.88

Mech. 1st Class.....	23.34	23.88
Mech. 2nd Class/Flagman	17.50	17.91

Additional 1.00 per hr. for crew on helicopter job.

Above rates applicable on all overhead Transmission line work where other construction trades are or have been involved. This applies to transmission line work only, not other construction.

Lineman/Technician.....	27.96	28.64
Dynamite/welder.....	27.96	28.64
Digging Mach.....	25.16	25.78
Trctr Trlr Driver	23.77	24.34
Truck Dr/Groundman.....	22.37	22.91
Mech. 1st Class..... .	22.37	22.91
Mech. 2nd Class.....	16.78	17.18
Flagman.....	16.78	17.18
Certified Welder.....	29.36	30.07
Cable Splicer	30.76	31.50

Additional 1.00 per hour on helicopter job.

Above rates apply on Switching Structures, Maintanence projects, Railroad Catenary install/maint, Third rail installation, Bonding of Rails and pipe type cable installation.

Lineman /Tech/Dynamite	26.68	27.36
Welder/Cable Splicer	26.68	27.36
Digging Machine Operator	24.01	24.62
Tractor Trailer Driver	22.68	23.26
Truck Driver/Groundman	21.34	21.89
Mech. 1st Class.....	21.34	21.89
Mech. 2nd Class/Flagman	16.01	16.42

Additional 1.00 per. hr. for crew on helicopter job.

Above rates applicable on all overhead and underground distribution and maintenance work, and all overhead and underground transmission line work where no other construction trades are or have been involved.

Lineman/tech/welder.....	27.26	27.36
Cable splicer.....	29.99	30.10
Certified welder (pipe-type cable).....	28.62	28.73
Digging machine operator	24.53	24.62
Tractor trailer driver..	23.17	23.26
Mechanic 1st class.....	21.81	21.89
Groundman/Truck driver..	21.81	21.89
Mechanic 2nd class/flagman	16.36	16.42

Additional $ 1.00 per hour for crew on helecopter job.

Above rates applicable on all electrical SUB-STATIONS and all other work not defined as "Utility outside electrical work".

OVERTIME PAY: See (B, E, Q,) on OVERTIME PAGE.

Prevailing Rate Schedule

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HOLIDAYS:
Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Gov. Election Day.
Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Gov Election Day.
SUPPLEMENTS for holidays paid at straight time.

The following APPRENTICE rates and the following SUPPLEMENTAL benefits apply to all classification categories of CONSTRUCTION, TRANSMISSION and DISTRIBUTION.

APPRENTICES: (1000) hr terms at the following percentage of Journeyman's wage.

1st.	2nd.	3rd.	4th.	5th.	6th.	7th.
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS:(per Hour worked including above listed holidays.

$ 6.85 plus 7.5% of wage	7.00 plus 7.5% of wage

6-1249a

LINEMAN/ELECTRIC

WAGES(per hour)

	7/01/1999	4/30/2000
Certified Welder... ...	25.00	25.71
Lineman/Technician.....	23.81	24.49
Digging Mach.....	21.43	22.04
Tractor trailer driver.	20.24	20.82
Truck Driver/groundman.	19.05	19.59
Mechanic 1st Class.....	19.05	19.59
Mechanic 2nd Class/Flagman	14.29	14.69

Above rates applicable on ALL Lighting and Traffic Signal Systems with the installation, testing, operation, maintenance and repair of all traffic control and illumination projects, traffic monitoring systems and road weather information systems.

OVERTIME PAY: See (B, E, Q,) on OVERTIME PAGE.

HOLIDAYS:
Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Gov Election Day.
Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Gov Election Day.
Supplements paid at STRAIGHT TIME rate for holidays.
Overtime: (5, 6, 8, 13, 25)
The following APPRENTICE Rates and the following SUPPLEMENTAL BENEFITS apply to all classifications.

APPRENTICES: (1000) hour terms at the following percentage of Journey's wage.

1st.	2nd.	3rd.	4th.	5th.	6th.	7th.
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS: per Hour Worked including above listed holidays.

	$ 6.85 plus 7% of wage	7.00 plus 7% of wage

NOTE(S): Each employee in a helicoptor crew to receive $ 1.00 above regular pay rate.

6-1249a-LT

LINEMAN - Pole Treater

WAGES(per hour)

	7/01/1999	6/01/2000	6/01/2001
POLE TREATER AND MAINTENANCE			
Pole treater 1st (Minimum 1 year experience)	$10.97	$11.24	$11.52
Pole treater 2nd (Minimum 6 months experience)	10.38	10.64	10.91
Pole treater 3rd (Minimum 3 months experience)	9.81	10.06	10.31
Inexperienced treater (Less than 3 months)	9.24	9.47	9.71

OVERTIME PAY: See (B, H) on OVERTIME PAGE.
HOLIDAYS
Paid : See (5, 6, 8, 10, 15) on HOLIDAY PAGE.
Overtime : See (5, 6, 8, 10, 15) on HOLIDAY PAGE.

SUPPLEMENTAL BENEFITS:(per hours worked including the above listed holidays)

	$ 3.15 plus 3% of wage	3.25 plus 3% of wage	3.35 plus 3% of wage

*NOTE.....ABOVE RATES APPLICABLE THROUGHOUT THE ENTIRE STATE EXCEPT THE FOLLOWING COUNTIES: BRONX, KINGS, NEW YORK COUNTY, QUEENS, RICHMOND, NASSAU, AND SUFFOLK COUNTIES.

6-1249pole

ELECTRICIAN (Syracuse)

WAGES(per hour)	7/01/2000	6/01/2001	6/01/2002
		ADDITIONAL	ADDITIONAL
Electrician.....	$ 22.00	$1.50	$1.50
Cable Splicer.....	24.20		

OVERTIME PAY: See (B, E*, Q) on OVERTIME PAGE
* Double Time after 8hrs. on saturday.
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

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APPRENTICES: (at the following percentage of journeyman's wage)

1st Period (0-1000 hrs)	40%	4th Period (3501-5000 hrs)	60%
2nd Period (1001-2000 hrs)	45%	5th Period (5001-6500 hrs)	70%
3rd Period (2001-3500 hrs)	50%	6th Period (6501-8000 hrs)	80%

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman	$ 8.68 plus 3% of wage	
Apprentices:	1st period	$2.99 plus 3% of wage
	2nd period	
	3rd period	$6.92 plus 3% of wage
	4th period	$7.14 plus 3% of wage
	5th period	$7.36 plus 3% of wage
	6th period	$7.58 plus 3% of wage

ELECTRICIAN
Teledata Rates

Teledata Installer... Perform installation and termination of teledata cable and installation of teledata equipment. Diagnostic and "start up" testing are excluded from the scope of the installer.

Teledata Technician.. May perform all facets of teledata work covered by this agreement including diagnostic and "start up" testing.

WAGES (per hour)	7/01/2000
Technician.....	$ 18.00
Journeyman installer..	16.20

OVERTIME PAY: See (B,E,Q) on OVERTIME page

HOLIDAYS:
Paid: LABOR DAY AND JULY 4TH
Overtime: LABOR DAY AND JULY 4TH

SUPPLEMENTAL BENEFITS: (per hour worked)

Technician	$ 4.00 plus 3% of wage
Journeyman Installer	3.85 " "

Prevailing Rate Schedule

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No. 6-43-S

IRONWORKER

WAGES(per hour)

	7/01/2000	5/01/2001	5/01/2002
Structural/Reinf/rebar	$20.00	add $.75	add $ .75
Mach Mover & Rigger..	20.00		
Ornamental & curtain wall/window.....	20.00		
Chain Link Fence/securty	20.00		
Sheeter/Bridge rail..	20.00		
Pre-Cast erector	20.00		
Stone Derrickman	20.00		
Pre-Engineered bldg Erector	20.00		

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5,6) on HOLIDAY PAGE

APPRENTICES: (1) year terms at the following rates.

1st	2nd	3rd	4th
50%	60%	75%	85%
$10.00	12.00	15.00	17.00

SUPPLEMENTAL BENEFITS: (Per hour worked)

Journeyman	$12.09
All apprentices	3.89

6-60

PAINTER

WAGES(per hour) 7/01/2000

Brush or roll, taper.....	$ 18.55
Bosum Chair,Swing Scaffold.....	19.15
Window Platform, Structural steel..	19.15
Spray.....	19.55
Sandblasting.....	19.40
Bridge.....	19.35
Spray Epoxy.....	20.05
Brush/Roller Epoxy.....	19.65
Line Striping.....	18.55

Additional $ .60 per hr for work from ladder 30' above base of ladder

OVERTIME PAY: See (B, E, Q,) on OVERTIME PAGE
HOLIDAY:
PAID: See (1) on HOLIDAY PAGE
OVERTIME: See (5,6) on HOLIDAY PAGE

APPRENTICES: (1/2) year terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th	5th	6th

Prevailing Rate Schedule

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50%	55%	60%	70%	80%	90%

SUPPLEMENTAL BENEFITS:(per hour worked)

$ 7.46* Note

*Note- For overtime hours $2.75 of this amount is paid at premium rate.

2-178 I

In the Town of Marathon.
THE FOLLOWING RATE APPLIES:

PLUMBER

WAGES(per hour)

	5/01/2000	5/01/2001	5/01/2002
Plumber.....	$ 20.96	Addit.	Addit.
Steamfitter.....	20.96	$ .95	$ .95

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE.
HOLIDAY:
Paid: See (1) on HOLIDAY PAGE.
Overtime: See (5, 6) on HOLIDAY PAGE.

APPRENTICES: (1) year terms at the following percentage of Journeyman's wage.

1st.	2nd.	3rd.	4th.	5th.
40%	50%	60%	70%	80%

SUPPLEMENTAL BENEFITS:(per hour worked)

$ 8.30

2-112

In the Remainder of the County.
THE FOLLOWING RATE APPLIES:

PLUMBER / STEAMFITTER

WAGES(per hour) 7/01/ 2000

Plumber/Welder/Steamfitter... $22.00
Refrigeration..... $21.05

OVERTIME PAY: Time & 1/2 for 9th. & 10TH. Hours Monday thru Friday and 1st 10 hours on Saturday; Double Time all additional O.T. hours

HOLIDAYS:
Paid: see (none) on holiday page
Overtime: see (5 , 6) on holiday page

APPRENTICES: (1/2) year terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th

Prevailing Rate Schedule

New York State Department of Labor

Case Number

0000128
CORTLAND 2000A

50%	50%	55%	55%	60%	60%	70%	70%	85%	85%

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman	$10.11
Appr 1st term	4.85
Appr 2nd term	4.85
Appr All other terms	7.46 plus term % of $ 2.65

No. 6-267

__ WELDER

Welder...To be paid the rate of the mechanic performing the work.

LINEMAN-TREE CLEARANCE/TRIMMING

Applies to line clearance, tree work and right-of-way preparation on all new or existing overhead electrical, telephone and CATV lines where construction is involved. Does not apply to beautification or line of sight trimming.

WAGES(per hour)

	07/01/1999	01/01/2000
Tree Trimmer:		
Treeman.....	$ 14.91	15.28
" Equip. Operator.	13.21	13.54
" Mechanic.....	13.21	13.54
" Truck Driver....	11.22	11.50
" Inexperienced Grdsman	9.30	9.53
" Flagman	6.72	6.89

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE.

HOLIDAYS:
Paid: See (5, 6, 8, 10, 15, 16) on HOLIDAY PAGE.
Overtime: See (5, 6, 8, 10, 15, 16) on HOLIDAY PAGE.
Supplements paid at STRAIGHT TIME rate for holidays.
Overtime: (5, 6, 8, 10, 15, 16)

SUPPLEMENTAL BENEFITS: (per hour worked including above listed holidays.

$ 3.65 plus 3% of wage	3.75 plus 3% of wage

No. 6-1249TT

SURVEY CREW - Consulting Engineer

Feasibility and preliminary design surveying, line and grade surveying for inspection or supervision of construction when performed under a consulting engineer agreement.

SURVEY CLASSIFICATIONS:
Party Chief- One who directs a survey party.

Prevailing Rate Schedule

New York State Department of Labor

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CORTLAND 2000A

Instrumentman- One who runs the instrument and assists the Party Chief.
Rodman- One who holds the rods and in general, assists the survey party.

WAGES:(per hour)

	7/01/2000	6/01/2001	6/01/2002
Survey Rates:			
Party Chief	$ 20.93	$21.74	$22.45
Instrument,Rodperson..	18.44	19.25	19.96

Additional 3.00 per hr. for work in a tunnel.
Additional 2.50 per hr. for DEC or EPA certified toxic or hazardous waste work.

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAY:
Paid: See (5,6) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

SUPPLEMENTAL BENEFITS: (per hour worked)

	$11.15	$11.60	$12.15

6-545Dcalg

SURVEY CREW - Heavy/Highway

SURVEY CLASSIFICATIONS:
Party Chief- One who directs a survey party.
Instrumentman- One who runs the instrument and assists the Party Chief.
Rodman- One who holds the rods and in general, assists the survey party.

WAGES:(per hour)

	7/01/2000	6/01/2001	6/01/2002
Survey Rates:			
Party Chief	$21.93	$22.74	$23.45
Instrument/Rodman.....	19.44	20.25	20.96

Additional 3.00 per hr. for work in a tunnel.
Additional 2.50 per hr. for DEC or EPA certified toxic or hazardous waste work.

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAY:
Paid: See (5, 6) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

APPRENTICE: (1 yr or 1000 hr) terms at the following wage rates.

	1st	2nd	3rd
7/01/2000	$ 12.50	14.01	15.82
6/01/2001	13.21	14.80	16.48
6/01/2002	13.77	15.38	17.04

SUPPLEMENTAL BENEFITS: (per hour paid)

Journeyman	$11.15	$11.60	$12.15
Appr 1st	5.85	5.90	6.10
Appr 2nd	7.40	7.50	7.80
Appr 3rd	8.65	9.00	9.45

6-545Dhalg

CARPENTER

Prevailing Rate Schedule

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WAGES(per hour) — 7/01/2000

HEAVY & HIGHWAY

PILEDRIVER	21.17
CERTIFIED WELDER	22.67
DIVER-WET DAY	380. PR. 8 HR. DAY
DIVER-DRY DAY.....	22.17
TENDER	22.17

OVERTIME PAY: See (B, E*, Q) on OVERTIME PAGE.
*Double time after 8 hours on Saturday.
HOLIDAYS:
Paid: See (1) on HOLIDAY PAGE.
Overtime: See (5,6) on HOLIDAY PAGE.

APPRENTICES: (1/2) year terms at the following percentage of journeyman's wage.

1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.
50%	55%	60%	65%	70%	75%	80%	85%

SUPPLEMENTAL BENEFITS:(per hour worked)

Journeyman	$7.805		
Appr. 0 thru 6 mos	$7.805	24 thru 30 mos	$7.805
Appr. 6 thru 12 mos	$7.805	30 thru 36 mos	$7.805
Appr. 12 thru 18 mos	$7.805	36 thru 42 mos	$7.805
Appr 18 thru 24 mos	$7.805	42 thru 48 mos	$7.805

5-187HH

LABORER

Heavy/Highway Laborer:
Group # A: Basic, Drill Helper, Flagman, Outboard and Hand Boats.
Group # B: Bull Float, Chain Saw, Concrete Aggregate Bin, Concrete Bootmen, Gin Buggy, Hand or Machine Vibrator, Jack Hammer, Mason Tender, Mortar Mixer, Pavement Breaker, Handlers of all Steel Mesh, Small Generators for Laborers' Tools, Installation of Bridge Drainage Pipe, Pipe Layers, Vibrator Type Rollers, Tamper, Drill Doctor, Tail or Screw Operator on Asphalt Paver, Water Pump Operators(1-1/2" and Single Diaphragm), Nozzle (Asphalt, Gunite, Seeding, and Sand Blasting), Laborers on Chain Link Fence Erection, Rock Splitter and Power Unit, Pusher Type Concrete Saw and all other Gas, Electric, Oil and Air Tool Operators, Wrecking Laborer.
Group #C: All Rock or Drilling Machine Operators (Except Quarry Master and Similar Type), Acetylene Torch Operators, Asphalt Raker and Powderman.
Group #D: Blasters, Form Setters, St one or Granite Curb Setters.
Group #E: Hazardous Waste removal on a State or Federal designated waste site where revelent state or federal regulations require employees to wear personalprotection

WAGES(per hour) — 7/01/2000

Heavy/Highway Laborer:	
Group # A.....	18.24
Group # B.....	18.44
Group # C.....	18.64
Group # D.....	18.84

Prevailing Rate Schedule

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Group # E..... 20.24

OVERTIME PAY: See (8, E, Q) on OVERTIME PAGE
HOLIDAYS:
Paid: See (5, 6) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

SUPPLEMENTAL BENEFITS:(per hour worked)

$ 7.85

6-589/2h

MASON - HEAVY/HIGHWAY

WAGES(per hour)

	6/01/2000	6/01/2001
Heavy/Highway:		
Cement Mason	17.80	Addtl
Plasterer.....	17.80	$.60

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAY:
Paid: See (5,6) on HOLIDAY PAGE
Overtime: See (5,6) on HOLIDAY PAGE

APPRENTICES: (1/2) year terms at the following percentage of Journeymen's wage.

1st	2nd	3rd	4th	5th	6th
50%	55%	60%	65%	70%	80%

SUPPLEMENTAL BENEFITS:(per hour worked)

$ 8.86

6-17h

TEAMSTER-Heavy/Highway

GROUP 1: Warehousemen, Yardmen, Truck Helpers, Pickups, Panel Trucks, Flatboy Material Trucks(straight jobs), Single Axel Dump Trucks, Dumpsters, Material Checkers and Receivers, Greasers, Truck Tiremen, Mechanics Helpers and Parts Chasers, Tandems and Batch Trucks, Mechanics, Semi-Trailers, Low-boy Trucks, Asphalt Distribitor Trucks, and Agitator, Mixer Trucks and dumpcrete type vehicles, Truck Mechanic, Fuel Trucks.
GROUP 2: Specialized Earth Moving Equipment- Euclid type, or similar off-highway equipment, where not self-loading, Straddle (Ross) Carrier, and self-contained concrete mobile truck, Off-highway Tandem Back-Dump, Twin Engin Equipment and Double-Hitched Equipment where not self-loading.

WAGES(per hour) 7/01/2000

Heavy/Highway
Group #1..... 16.59
Group #2..... 16.79
For work bid on or after April 1, 1982 there shall be a 12 month carryover of the negotiated rate in effect at the time of bid.

OVERTIME PAY: See (B,J,E2) on OVERTIME PAGE

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HOLIDAY:
Paid: See (5, 6) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

SUPPLEMENTAL BENEFITS:(per hour PAID)

$ 9.50

No. 6-317a.hh

POWER EQUIPMENT OPERATOR - Heavy/Highway

CLASS A: Asphalt Paver (fixed screed 10' width and over), Extend a-mat paver, Automated Concrete Spreader, Automatic Fine Grader, Backhoe (except tractor-mounted,rubber tired), Belt Placer, Blacktop Plant (automated) Boom Truck 100' & Over (jib & boom), Cableway, Caisson Auger, Central Mix Concrete Plant(automated), Hydraulic crane, (over 5 tons capacity), Concrete Curb Machine, Self-propelled, Slipform, Concrete Pump(8" or over), Crane, Derricks, Dragline, Dredge, Excavator (all purpose-hydraulic-Gradall or similar), Front End Loader(4c.y.& over), Head Tower (Sauerman or equal), Hoist (two or three drum), Belt loader, Hydrodemolition Equip (self contained) Maint. Eng, Mine Hoist, Mucking Machine or Mole, Overhead Crane(Gantry or Straddle Type), Pavement Profiler over 300 H.P., Pile Driver, Power Grader, Road widener, Scraper, Shovel, Side Boom, Slip Form Paver(If a second man is needed, he shall be an Oiler), Tractor Drawn Belt Type Loader, Truck Crane, Truck or Trailer Mounted Chipper(self-feed), Tug Oper.(manned, rented equipt excluded), Tunnel Shovel.

CLASS B: Asphalt paver under 10 ft width, Automated slope paving machine, Backhoe (Tractor-Mounted,Rubber Tired) Blacktop Plant (non-automated),Blast or Rotary Drill (Truck or Tractor Mounted), Boom Truck under 100' (boom & jib), Boring Machine, Directional boring machine, Bridge deck finishing machine, Cage Hoist, Central Mix Plant (Non Automated),All Concrete Batching Plants, Hydraulic crane (5 tons & under), Compressors(4 or less exceeding 2,000 c.f.m.combined capacity), Concrete Paver over 16S, Concrete Pump (Under 8"), Core Drill (skid, truck mtd. or track), Crusher, Diesel Power Unit, Drill Rigs (Tractor Mtd), Fork Lift, F.E.Loader(under 4 c.y.), Hi-Pressure Boiler (15 lbs.& over), Hoist(One Drum), Hydro Axe, Kolman Plant Loader & similar type loaders(if employer requires another man, he shall be Oiler), L.C.M.Work Boat Oper, Locomotive, Lubrication Eng/Greaseman, Welder, Mixer(f or stabilized base-self propelled), Pavement Profiler(under 300H.P.) Plant Engineer, Pump Crete, Refrigeration Equipment (for soil stabilization), Roller(all above grade), Sea Mule, Skid Steer Bobcat Type Loader, Self-propelled rubbleizer, Stationary central compressed air plant (5000cfm and up), Tractor with Dozer and/or Pusher, Trencher, Tugger Hoist, Vermeer Saw (ride-on), Winch and Winch Cat, Log Skidder,

CLASS C:Aggregate Plant, A Frame Truck, Ballast Regulator (ride-on), Boiler(used in conjunction with production), Cement & Bin oper, Compressors (4 under 2,000 cfm combined capacity; or 3 orless with more than 1200 cfm. but not to exceed 2,000 c.f.m), Compressors (any size but subject to other provisions for compressors-Dust Collectors, Generators, Pumps, Welding Machines, Light Plants- 4 of any type orcombination), Concrete Paver or Mixer(16s & over), Concrete Saw (self propelled), Concrete Paverment Spreaders & Finishers, Conveyor, Elec. Pump Used in Conjunction with Well Point System, Farm Tractor with accessories, Form Tamper, Grout Pump, Gunite Machine, Hydra-spiker(ride-on), Hammers(hydraulic-self propelled), Hydraulic Pump (jacking system), Light plants, Mulching Mach., Oiler, Parapet conc. or pave.

grinder, Post Hole Digger & Post Driver, Power Sweeper, Power Heaterman, Roller(grade & fill), Scarifier(ride-on), Shell Winder, Steam Cleaner Span-saw(ride-on), Tamper(ride-on), All ride-on Tie Extractors, Tie Handlers, Tie Inserters, Tie spacers and Track Liners. Submersible Electric Pump(when used in lieu of well point system), Tractor, Vacuum machine (self propelled) Vibratory Compactor, Well Drill, Well point.

WAGES(per hour)	7/01/99	7/01/2000
Heavy/Highway:		
Master Mechanic....	$ 24.00	$ 24.55
CLASS A*.....	22.65	23.20
CLASS B.....	21.77	22.32
CLASS C.....	18.49	19.04

PIPELINE: Master mechanic, Class A and Class B rates apply.

*Additional 1.00 per hr for Crane with boom & jib over 100 ft.
*Additional 2.00 per hr for Crane with boom & jib 150 ft & over.
Additional 2.50 per hr for EPA or DEC classified toxic or hazardous waste work and employee is required by regulations to use or wear personal protection.

OVERTIME PAY: See (B, E, Q) on OVERTIME PAGE
HOLIDAY:
Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5,6,) on HOLIDAY PAGE

APPRENTICES: (1000) hour terms at the following rate.

	1st	2nd	3rd	4th
99/2000	$11.33	12.46	15.86	16.99

SUPPLEMENTAL BENEFITS:(per hour paid)

Journeyman/Appr Indentured before 4/01/98		$11.80	$ 12.25
Apprentice indentured after 4/01/98	1st	6.05	6.30
	2nd	7.55	7.80
	3rd	7.85	8.10
	4th	8.30	8.55

6-545h

MARINE CONSTRUCTION

WAGES (per hour)	10-01-99- 9-30-00
Hydraulic Dredge:	
Class A:	
Leverman.....	$ 26.68
Class B:	
Engineer.....	23.51
Derrick Operator.....	23.51
Chief Mate.....	23.18
Chief Welder.....	23.80

Electrician.....	22.82
Fill Placer.....	23.18
Asst.Fill Placer.....	21.29
Boat master.....	22.63
Class C	
Maintenance Eng.....	22.67
Mate.....	21.17
Welder Dredge.....	22.31
Spider Barge Oper....	22.12
Boat Capt.....	21.32
Steward.....	21.12
Chief of Party.....	21.17
Class D	
Deckhand.....	17.04
Oiler.....	17.69
Fireman.....	17.69
Shoreman.....	17.04
Rodman.....	17.04
Tug Deckhand.....	17.26

OVERTIME: See (8, F, R) on OVERTIME PAGE.

HOLIDAY:
PAID: See (5, 6, 8, 10, 15) on HOLIDAY PAGE.
OVERTIME: See (5, 6, 8, 10, 15) on OVERTIME PAGE.

The following SUPPLEMENTAL BENEFITS apply to ALL classifications.

SUPPLEMENTAL BENEFITS: (per hour worked)

All Class A & B	$ 4.46 (OVERTIME $ 1.25 EXTRA) plus 8% of WAGE
All Class C	$ 3.86 (OVERTIME $ 0.95 EXTRA) plus 8% of WAGE
All Class D	$ 3.26 (OVERTIME $ 0.65 EXTRA) plus 8% of WAGE

MARINE CONSTRUCTION

WAGES (per hour)

Prevailing Rate Schedule

New York State — Department of Labor

Case Number

0000128
CORTLAND — 2000A

	10-01-99- 9-30-00
Dipper & Clamshell Dredges:	
Class A:	
Operator.....	$ 26.26
Class B:	
Operator II.....	21.55
Engineer.....	23.12
Boat Master.....	21.74
Class C:	
Maintenance Eng...	22.07
Mate.....	20.57
Welder.....	21.72
Boat Capt.....	20.72
Chief of Party....	20.57
Class D:	
Oiler.....	17.39
Fireman.....	17.39
Scowman.....	16.73
Rodman.....	16.73
Tug Deckhand.....	16.96
Deckhand.....	16.96

HOLIDAY:
PAID: See (5, 6, 8, 10, 15) on Holiday Page.
OVERTIME: See (5, 6, 8, 10, 15) on Overtime Page.

SUPPLEMENTAL BENEFITS: (per hour worked)

Class A & B	$ 4.46 (OVERTIME $ 1.25 EXTRA) plus 8% of WAGE
	8% of wage
Class C	$ 3.86 (OVERTIME $ 0.95 EXTRA) plus 8% of WAGE
Class D	$ 3.26 (OVERTIME $ 0.65 EXTRA) plus 8% of WAGE

BIDDING & CONTRACT REQUIREMENTS

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.01 BORINGS AND SUBSURFACE DATA

It shall be the Contractor's obligation to satisfy himself as to the nature, character, quality and quantity of subsurface conditions likely to be encountered. Any reliance upon the subsurface information made available by the Owner or the Engineer shall be at the Contractor's risk. The Contractor agrees that he shall neither have nor assert against the Owner or Engineer any claim for damages for extra work or otherwise or for relief from any obligation of this Contract based upon the failure by the Owner or Engineer to obtain or to furnish additional subsurface information or to furnish all subsurface information in the Owner's or Engineer's possession or based upon any inadequacy or inaccuracy of the information furnished.

Certain subsurface information may be shown on separate sheets or otherwise made available by the Owner or Engineer to Bidders, Contractors and other interested parties. Neither such information nor the documents on which it may be shown shall be considered a part of the Contract Documents or Contract Drawings, it being understood that such information is made available only as a convenience, without express or implied representation, assurance, or guarantee that the information is adequate, complete, or correct, or that it represents a true picture of the subsurface conditions to be encountered, or that all pertinent subsurface information in the possession of the Owner or Engineer has been furnished.

Subsurface information contained in the remedial investigation, feasibility study and Remedial Design Report will be made available to potential bidders during normal business hours by contacting Barton & Loguidice, P.C. at 315-457-5200. This information is also available at the Cortland Free Library located at 32 Church Street, Cortland, New York 13045; Phone (604) 753-1042, of which Cortland County has designated as the local repository for this project.

00160.02 PRE-CONSTRUCTION CONFERENCE

A pre-construction conference will be held after award of the Contract, but prior to commencement of construction, at the site, and the Contractor shall have an authorized representative of his firm present at this meeting.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.03 POWER OF ATTORNEY

Attorneys-in-fact who sign Bid Bonds or Contract Bonds must file with each bond a certified and effectively dated copy of their power of attorney.

00160.04 LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable Federal and State laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

00160.05 NON-COLLUSIVE BIDDING CERTIFICATION

A Non-Collusive Bidding Certification form as bound in these documents must be executed and accompany the Bid.

00160.06 CHANGES AND AMPLIFICATIONS TO GENERAL CONDITIONS

00752.03 CONTRACTOR'S INSURANCE

Insurance shall provide that the policies shall not be changed or cancelled until thirty (30) days after written notice has been given to the Owner.

A. The additional named assureds pursuant to Article 00752.03C are as follows:

Cortland County
New York State Department of Environmental Conservation

B. The contractual liability details pursuant to Article 00752.03D are as follows:

Cortland County
New York State Department of Environmental Conservation

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.06 CHANGES AND AMPLIFICATIONS TO GENERAL CONDITIONS - Continued

00752.06 INDEMNIFICATION

The Contractor agrees to defend, indemnify and save harmless Cortland County and the New York State Department of Environmental Conservation from any and all claim(s) arising out of services performed by the Contractor hereunder, including those specifically arising out of the negligent acts or omissions (of contractors, officers, employees and agents, if applicable) including any cost for legal services in the defense of any said claim(s). The Contractor will have complete responsibility for health/disability and liability/malpractice insurance.

00753.05 LIABILITY FOR INJURIES OR DAMAGE

In Paragraph 3, the first sentence, between "and the Engineer" and "and their employees and agents" ADD "and the State of New York".

00755.04 TAXES

Purchases by the County of Cortland are not subject to any Federal, State or County Sales Tax. Exemption certificates will be executed upon request.

00756.04 APPROVED WORK SCHEDULES

The Contractor shall submit Plan of Operations (work plan) and a bar graph type work schedule to the Engineer contingent upon award to allow for review and comment by the New York State Department of Environmental Conservation and New York State Department of Health. The work schedule shall be updated monthly, or as ordered by the Engineer and the Contractor shall furnish updated copies to the Engineer.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.07 CHANGES AND AMPLIFICATIONS TO GENERAL REQUIREMENTS

01015.02 TRAVEL NOT OBSTRUCTED

In amplification of this Article, the work site is located within the boundaries of the Cortland County Landfill. This is a working landfill, and the Contractor shall not impair or interfere with normal landfill operations.

01015.03 CLEANING UP

The Contractor shall be permitted to dispose of the following refuse from this project at no cost:

a. Rubbish and construction and demolition debris shall be disposed of in the active landfill.

The Contractor shall provide all labor, materials and equipment to load, transport and dump refuse. Disposal of materials shall be during normal operating hours at the disposal facility.

01051 LAYOUT OF WORK

DELETE entire Section and SUBSTITUTE THEREFOR the following:

A. The Contractor shall be responsible for all survey and control needed for construction and shall utilize services of a licensed surveyor. The locations of selected vertical and horizontal control points are provided on the Contract Drawings. The Contractor shall verify bench marks and make all detail surveys needed for construction.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.07 CHANGES AND AMPLIFICATIONS TO GENERAL REQUIREMENTS - Continued

B. The Contractor shall set and maintain all necessary intermediate points, lines, and grades and elevations, and provide slope stakes, offset stakes, batter boards, stakes for pipe locations, and other such items at his own expense. Where the Contractor uses laser for control, he shall periodically check the grade and alignment during each day's operation. The Contractor shall furnish copies of construction of grade letters and cut sheets prepared by the Contractor to the Engineer in advance.

C. The accuracy of the Contractor's survey and other required data is the sole responsibility of the Contractor, and the furnishing of data to the Engineer does not constitute a transferral of responsibility for checking.

D. Prior to excavation activities and installation of the cover materials, the Contractor shall establish a maximum fifty (50) foot grid over the site and take elevations at each grid point. The Contractor shall take elevations at each grid location upon completion of excavation activities and at completion of placement of each lift of cap material (or as directed by the Engineer) to measure the volume of material excavated and thickness of the lifts and to substantiate that refuse removal and cap material installation are proceeding in accordance with the Specifications and Contract Drawings. The elevation data shall be transmitted to the Engineer in hard copy and diskette and be reviewed by the Engineer prior to the installation of the next layer of cap material. The Contractor may utilize additional, alternative methods to verify excavated volumes of material and lift thicknesses subsequent to prior review by the Engineer.

The cost to the Contractor of providing the services and materials specified in this Section 01051 shall be included in the price, a 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.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.07 CHANGES AND AMPLIFICATIONS TO GENERAL REQUIREMENTS - Continued

01510 WATER

In amendment to this Article, there is a sedimentation pond on site for the Contractor's use during construction for a non-potable water source. The Contractor shall be responsible for pumping and hauling of the water. The Owner makes no guarantee of the quantity or quality of the water available in the pond. The Contractor shall supply any additional water and all potable water from and off-site source at no additional cost to the Owner, but should be advised that there is an on-site well which has been successfully used on site for construction activities to a limited degree.

01580 PROJECT SIGN

A project sign is required. Refer to detail drawing at the end of this Section.

01590 ENGINEER'S FIELD OFFICE TRAILER

In amendment to Article 01590.02, the trailer office shall be not less than 8 feet by 30 feet. The Contractor shall provide a desktop, heavy-duty, electric, dry process reducing photocopying machine. The machine shall be capable of copying 8-1/2x11, 8-1/2x14 and 11x17 sheets. An adequate supply of copy paper in the three (3) sizes shall be provided. The supply of copy paper shall be replenished by the Contractor as required by the Engineer. All other facilities, office furniture and equipment shall be provided as specified.

An answering machine, cordless telephone and fax machine shall be supplied. Two direct phone lines shall be provided for field office use. One computer with color laser printer and internal modem capable of sending and receiving electronic mail as follows:

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.07 CHANGES AND AMPLIFICATIONS TO GENERAL REQUIREMENTS - Continued

Presario 1800T-500
Internet Notebook PC

Intel Mobile Pentium III Processor, 500 MHz
15.0" TFT Active Matrix Display
96 MB SyncDRAM
6.0 GB UltraDMA Hard Drive
Compact Disc Drive
ATI Rage LT Pro Hardware Accelerated
3D Graphics with 8 MB Video Memory
56K ITU V.90 Modem (PCI)[3]
Ultra Hi-Capacity Lilon Battery
256 KB Integrated "On-chip" cache
10/100 BaseT Ethernet Network Card
Microsoft Featured Home Collection + Windows 98

00160.08 CONTRACTOR'S HOURS OF OPERATION

The landfill is open Monday through Friday, 7:30 A.M. to 3:30 P.M., and Saturdays, 8:00 A.M. to 2:30 P.M. Contractor will be permitted to work other hours and days with prior approval from the Owner. To work other than a normal 8 hour work day 5 days/week requires prior approval of the County and the New York State Department of Labor.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS

The following are mandatory Contract provisions to be included in all New York State Department of Environmental Conservation Regulated Superfund Remediation (Title 3) Municipal/Consultant-Service Contracts.

Mandatory Provisions

NON-DISCRIMINATION REQUIREMENT

1. In accordance with Article 15 of the Executive Law (also known as the Human Rights Law) and all other State and Federal statutory are constitutional non-discrimination provisions, the Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, age, disability or marital status.

   To the extent that such services are to be provided pursuant to the Contract, the following paragraph is required:

   Furthermore, in accordance with Section 220-e of the Labor Law, if this is a Contract for the construction, alteration or repair of any public building or public work or for the manufacture, sale or distribution of materials, equipment or supplies, and to the extent that this Contract shall be performed within the State of New York, Contractor agrees that neither it nor its subcontractors shall, by reason of race, creed, color, disability, sex or national origin: a) discriminate in hiring or promotion of any individual who is qualified and available to perform the work; or b) discriminate against or intimidate any employee hired for the performance of work under this Contract.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

WAGE AND HOUR PROVISIONS

2. If this is a public work Contract covered by Article 8 of the Labor Law or a building service Contract covered by Article 9 thereof, neither Contractor's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said statutes, except as otherwise provided in the Labor Law and set forth in prevailing wage and supplement schedules issued by the State Labor Department. Furthermore, Contractor and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the Labor Law.

RECORD KEEPING REQUIREMENT

3. The Contractor shall maintain all books, documents, papers, and other evidence directly pertinent to the performance of work under this Contract in accordance with generally acceptable accounting principles and practices consistently applied, and 40 CFR Part 30 in effect during the term of this Contract. The Municipality, the Department of Environmental Conservation, the State Comptroller, the State Attorney General, the State Department of Labor, and, in the event of Federal funding, the USEPA, the Comptroller General of the United States, the United States Department of Labor or any of their authorized representatives shall have access to all such books, records, documents and other evidence for the purpose of inspection, audit and copying for a period of six years following final payment or the termination of this Contract whichever is later, and any extensions thereto. These books, records, documents and other evidence shall be accessible within the State of New York to the agencies identified above for the time period stated above. "Termination of this Contract", as used in this clause, shall mean the later of completion of the work of the Contract or the end date of the term stated in the Contract.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

CONFLICT OF INTEREST

4. To the best of the Contractor's knowledge and belief, the Contractor warrants that there are no relevant facts or circumstances which could give rise to an organizational conflict of interest, as herein defined, or that the Contractor has disclosed all such relevant information to the Municipality.

An organizational conflict of interest exists when the nature of the work to be performed under this Contract may, without some restriction on future activities, either result in an unfair competitive advantage to the Contractor or impair the Contractor's objectivity in performing the work for the Municipality.

The Contractor agrees that if an actual, apparent or potential organizational conflict of interest is discovered at any time after award, whether before or during performance, the Contractor will immediately make a full disclosure in writing to the Municipality and the State Department of Environmental Conservation. This disclosure shall include a description of actions which the Contractor has taken or proposes to take, after consultation with the Municipality, to avoid, mitigate, or minimize the actual or potential conflict.

Remedies - The Municipality may terminate this Contract in whole or in part, if it deems such termination necessary to avoid an organizational or personal conflict of interest, or an unauthorized disclosure of information. If the Contractor was aware of a potential conflict of interest prior to award, or discovered an actual or potential conflict after award and did not disclose or misrepresented relevant information to the

Municipality, the Municipality may terminate the Contract, or pursue such other remedies as may be permitted by law or this Contract. The terms of other applicable Contract provisions regarding termination shall apply to termination by the Municipality pursuant to this clause.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

The Contractor further agrees to insert in any subcontract hereunder, provisions which shall conform to the language of this clause.

(a) In addition to the requirements of the above clauses with respect to "Organizational Conflicts of Interest", the following provision with regard to employee personnel performing under this Contract shall apply until the earlier of the termination date of the affected employee(s) or the duration of the Contract.

The Contractor agrees to notify the Department and the Municipality immediately of any actual, apparent or potential personal conflict of interest with regard to any employee, subcontractor employee, or consultant working on or having access to information regarding this Contract, as soon as the Contractor becomes aware of such conflict. A personal conflict of interest is defined as a relationship of an employee, subcontractor employee, or consultant with an entity that may impair or appear to impair the objectivity of the employee, subcontractor employee, or consultant in performing the Contract work. The Municipality will notify the Contractor of the appropriate action to be taken.

(b) To the extent that the work under this Contract requires access to proprietary or confidential business or financial data of other companies, and as long as such data remains proprietary or confidential, the Contractor shall protect such data from unauthorized use and disclosure and agrees not to use it to compete with such companies.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

(c) The Contractor shall certify annually that, to the best of the Contractor's knowledge and belief, all actual, apparent or potential conflicts of interest, both personal and organizational, have been reported to the Department and the Municipality. Such certification must be signed by a senior executive of the Contractor and submitted in accordance with instructions provided by the Municipality. Along with the annual certification, the Contractor shall also submit an update of any changes in the conflict of interest plan submitted with its proposal for this Contract. The initial certification shall cover the one-year period from the date of Contract award, and all subsequent certifications shall cover successive annual periods thereafter. The certification is to be submitted no later than 45 days after the close of the previous certification period covered.

(d) The Contractor recognizes that employees in performing this Contract may have access to data, either provided by the Department or the Municipality or first generated during Contract performance, of a sensitive nature which should not be released without Department/Municipality approval. Therefore, the Contractor agrees to obtain confidentiality agreements from all employees working on requirements under this Contract including subcontractors and consultants. Such agreements shall contain provisions which stipulate that each employee agrees that the employee will not disclose, either in whole or in part, to any entity external to the Department, Department of Health or the New York State Department of Law, any information or data provided by the Department or first generated by the Contractor under this Contract, any site-specific cost information, or any enforcement strategy without first obtaining the written permission of the Municipality. If a Contractor, through an employee or otherwise, is subpoenaed to testify or produce documents, which could result in such disclosure, the Contractor must provide immediate advance notification to the Municipality/Department so that the Department can authorize such disclosure or have the opportunity to take action to prevent such disclosure. Such agreements shall be effective for the life of the Contract and for a period of five (5) years after completion of the Contract.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

(e) The Contractor agrees to insert in each subcontract or consultant agreement placed hereunder (except for subcontracts or consultant agreements for well drilling, fence erecting, plumbing, utility hookups, security guard services, or electrical services) provisions which shall conform substantially to the language of this clause, including this paragraph (e), unless otherwise authorized by the Municipality.

If this is a Contract for work related to action at an inactive hazardous waste site, the following paragraph shall apply:

(f) Due to the scope and nature of this Contract, the Contractor shall observe the following restrictions on future hazardous waste site contracting for the duration of the Contract.

(1) The Contractor will be ineligible to enter into a Contract for remedial action projects for which the Contractor has developed the statement of work or the solicitation package.

(2) The Contractor, during the life of the work assignment and for a period of five (5) years after the completion of the work assignment, agrees not to enter into a Contract with or to represent any party with respect to any work relating to remedial activities or work pertaining to a site where the Contractor previously performed work for the Department and/or Municipality under this Contract without the prior written approval of the Department.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

(3) The Contractor agrees in advance that if any bids/proposals are submitted for any work for a third party that would require written approval of the Municipality/Department prior to entering into a Contract because of the restrictions of this clause, then the bids/proposals are submitted at the Contractor's own risk, and no claim shall be made against the Municipality/Department to recover bid/proposal costs as a direct cost whether the request for authorization to enter into the Contract is denied or approved.

AFFIRMATIVE ACTION

5. (a) The Contractor agrees to be bound by the provisions of New York State Executive Law, Article 15-A, Sections 312, 313 and 316.

The Contractor is required to make good faith efforts to solicit the meaningful participation of minority and women owned business enterprises identified in the Directory of Certified Businesses provided by the New York State Department of Economic Development's Division of Minority and Women's Business Development.

(b) The Contractor agrees to include the requirements set forth in paragraph (a) above and the paragraphs (c), (d), and (e) and (f) below in every subcontract in such a manner that the provisions will be binding upon each subcontractor as to work in connection with such Contract. For the purpose of this paragraph, a "subcontract" shall mean an agreement providing for a total expenditure in excess of $100,000 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon in which a portion of Contractor's obligation under the State Contract is undertaken or assumed.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

(c) The Contractor will not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability or marital status, and will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. For purposes of this Article, affirmative action shall mean recruitment, employment, job assignment, promotion, upgradings, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation.

(d) At the request of the contracting agency, the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein.

(e) The Contractor shall state, in all solicitations or advertisements for employees, that, in the performance of the Contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

(f) The Contractor also agrees to incorporate into any Contract with subcontractors, contractual provisions applicable to record keeping, reporting, notice requirements and actions determined to be necessary by the Department to implement the requirements of the Minority/Women Business Enterprise-

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.09 MANDATORY PROVISIONS FOR TITLE 3 CONTRACTS - Continued

Equal Employment (M/WBE-EEO) utilization plan, and of Executive Law Article 15-A, regulations promulgated thereunder, and other applicable law and regulations. Minority and Women Business Enterprise (M/WBE) goals are 12% MBE and 5% WBE as well as equal opportunity goals of 10% minority and 10% women. Prior to Contract award an MBE/WBE Plan must be submitted to the Owner by the successful Bidder.

00160.10 MANDATORY JOB COORDINATION MEETINGS

Mandatory Job Coordination Meetings with the Project Superintendent from Contract No. 1 and subcontractors shall be conducted bi-weekly as a minimum or as requested by the New York State Department of Environmental Conservation.

00160.11 PLAN OF OPERATIONS (WORK PLAN)

Prior to commencement of work, the Contractor shall develop and submit methods and sequencing of all intended operations hereinafter referred to as the Work Plan. The Work Plan shall include, but not be limited to, methods, plans, and drawings necessary for staging trailers and equipment, stockpiling materials, designating work zones and requirements for other construction activities. Construction activities shall not be initiated until the methods and sequencing of all operations are reviewed by the Engineer.

00160.12 CONTRACTOR'S OFFICE

The Contractor shall erect, furnish and maintain a field office with a telephone, at the site during the entire period of construction. The Contractor or an authorized agent shall be present at said office at all times or at a definite time while work is in progress. An external telephone ringer will be provided by the Contractor. Readily accessible copies of the Contract Documents, the latest approved working drawings, Contractor annotated record drawings, Contractor's Dust Control Program, HASP, Staging Plan, and other documents necessary or instrumental in completing the project shall be kept at said field office. This office shall be heated and shall be equipped with proper sanitary facilities.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.13 SOIL DEBRIS AND WASTE TO BE SURVEYED AND RELOCATED

The Contractor shall provide a preconstruction topographic survey of the soil, debris and waste areas shown to be relocated on the Contract Drawings. Following the survey the Contractor shall relocate the soil, debris and waste to within the limits of the landfill cap system in accordance with the section entitled Soil, Debris, and Waste Relocated from outside the limits of the cap. Following the relocation of the construction debris the Contractor shall survey the area and determine the actual volume of construction debris relocated. All survey and volume information shall be provided to the Engineer. All survey data shall be provided by a licensed New York State surveyor.

00160.14 SOIL, DEBRIS AND WASTE RELOCATED FROM OUTSIDE THE LIMITS OF THE CAP

A. The Contractor shall excavate and relocate the soil, debris and waste from the depicted areas shown on the Contract Drawings. Excavation and relocation of soil from these areas shall occur as soon as possible following mobilization to facilitate verification sampling of these areas. The soil debris and waste from these areas shall be relocated to within the limits of the cap system in accordance with the Contract Specifications. The Contractor shall install common fill cover over the soil, debris and waste relocated to within the limits of the cap system from the areas specified above. The common fill cover shall have a minimal thickness of 1 foot. The Contractor shall secure this area and shall be responsible for its maintenance.

B. Refuse excavated areas shown as remaining unfilled shall have final grading plans submitted to the Engineer. Final grading plans shall be adjusted in the field based on final limits of excavated refuse per direction of the Engineer.

C. The Contractor shall construct and maintain all temporary access roads required for construction activities under this Contract. All temporary construction access roads shall be removed following construction.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.15 WATER SERVICE TO MAINTENANCE BUILDING

The existing water service to the Maintenance Building shall be removed and replaced in kind. Installation shall be in accordance with standard specification procedures included in the Contract. Proposed materials of construction shall be submitted to the Engineer for review prior to use.

00160.16 CONTRACT DOCUMENTS HIERARCHY

The following documents shall constitute integral parts of this Agreement, the whole to be collectively known and referred to as the Contract Documents or the Contract, and in the case of discrepancies among any parts of the Contract Documents, preference shall be given in the following order.

a. Addenda (later dates taking precedence over earlier dates)
b. Additional Instructions
c. General Conditions & General Requirements
d. Advertisement
e. Information for Bidders
f. Bid
g. Payment Items
h. Technical Specification Sections
i. Contract Drawings (detailed drawing taking precedence over general drawings)

00160.17 REQUIRED BID SUBMITTALS

The following are to be submitted within the time periods indicated. At the option of Cortland County, failure to make or amend a submittal will constitute proof that the Bidder has abandoned all rights and interests in the Contract; that the Bid Security is forfeited as liquidated damages; and that the work may be awarded to another Bidder in a manner consistent with Law.

a. The following items are to accompany Contractor's Bid:

    1. Form of Bid filled out.

    2. Bid Bond or Certified Check.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.17 REQUIRED BID SUBMITTALS - Continued

3. Non-Collusive Certificate

b. The following items shall be submitted within 5 days of notification that the Bidder is the apparent low Bidder:

1. Off-site permitted facility to receive any material along with a copy of the facilities permit.

2. Plan of Operations (Work Plan) and Progress Schedule, Dust Control Plan, Health and Safety Plan, Construction Quality Control Plan, Erosion and Sedimentation Control Plan.

3. Statement of Surety's Intent, complete and signed by and duly authorized surety company licensed to do business in the State of New York.

4. A copy of the proposed site pollution liability insurance policy. If Bidder is unable to obtain the site specific $5 million Pollution Liability Insurance, Department requires letters from three (3) sureties stating that the additional Pollution Liability Insurance is unavailable.

5. A description of projects completed by Bidder documenting its experience in this type of work.

6. Proof of Availability of Insurance or Certificate of Insurance with endorsements.

7. NYS Uniform Contracting Questionnaire (completed) or affidavit of no change (if appropriate).

8. Preliminary schedule and acceptance M/WBE utilization plan (refer to forms at the end of this Section).

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.17 REQUIRED BID SUBMITTALS - Continued

9. Any other information that demonstrates the Bidder's ability to perform the work described herein.

10. Low Bidders may be asked to submit additional information to demonstrate competency.

c. The following items shall be submitted by the apparent low Bidder within 14 days from the date of the Award letter of the Contract.

1. Executed Agreement and Rider to Appendix B (six copies with original signatures).

2. Performance Bond with Power of Attorney & Surety Financial Statement (original and five copies).

3. Labor & Materials Bond with Power of Attorney & Surety Financial Statement (original and five copies).

4. Bid Breakdown of Items (original)

5. Certificates of Insurance (original and five copies).

6. Ten copies of each of the documents (Dust Control Program, HASP, Plan of Operation (Work Plan), Erosion and Control Plan, Construction Quality Control Plan and Schedule Sampling Plan, shall be provided to the Engineer prior to initiating construction activities for review and NYSDEC approval.

00160.18 SURVEYED QUANTITIES

In place quantities shall be submitted to the Engineer prepared by a licensed New York State surveyor for Payment of all unit price items and Payment Section 02003 - Site Work. The Contractor shall pay for the services of a licensed surveyor and include the cost of the same in this Bid. Final payment quantities will be based upon surveyed quantities.

SECTION 00160

ADDITIONAL INSTRUCTIONS

00160.19 ELECTRICAL REQUIREMENTS

a. The Contractor shall have all electrical work inspected by the New York Board of Fire Underwriters.

b. The Contractor shall furnish to the Engineer a certificate of compliance stating that the completed installation complies with the requirements of the National Electrical Code. This certificate shall be completed by the agency listed above.

00160.20 LINER SUBBASE

1. Prior to installation of liner material, all vegetation, rocks, debris, etc. and other deleterious materials, shall be removed from the surfaces to be covered with the liner material. The surface shall be free from stones or clods greater than 1/4-inches in diameter. Any roots ½ inch or over in diameter shall be removed. An depressions, potholes, ruts, etc., in the surfaces to be covered shall be filled with the appropriate soil material and compacted to final grade. The finished surface shall be smooth with no abrupt projections to damage the liner material.

2. The supporting layer shall be maintained in a smooth, uniform, and compacted condition during installation of the liner material. The subgrade surface shall be observed daily by the Contractor to evaluate the surface condition. The Contractor shall provide written acceptance of the subgrade to the Engineer prior to installation of the liner material. No installation of the liner material shall commence until the surface is accepted by the Contractor. Any damage to the subgrade caused by the Contractor's operations shall be repaired at no additional cost to the Owner. No liner material or other geosynthetic material shall be placed on a subgrade that has become softened by water or overly dried, until it has been properly reconditioned and/or recompacted. The Contractor shall be required to repair or re-work any area of the prepared surface requested by the Engineer.

END OF SECTION

CORTLAND COUNTY LANDFILL CLOSURE
CORTLAND COUNTY LANDFILL

SITE NUMBER 712001
CORTLAND COUNTY, NEW YORK

CLOSURE ACTIVITIES FUNDED BY:
TITLE 3 OF THE 1986 ENVIRONMENTAL QUALITY BOND ACT
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
GEORGE E. PATAKI, GOVERNOR
JOHN P. CAHILL, COMMISSIONER

CORTLAND COUNTY, NEW YORK
W. STEPHEN HARRINGTON, COUNTY LEGISLATURE CHAIRMAN
RALPH PITMAN, DIRECTOR OF SOLID WASTE

A

A

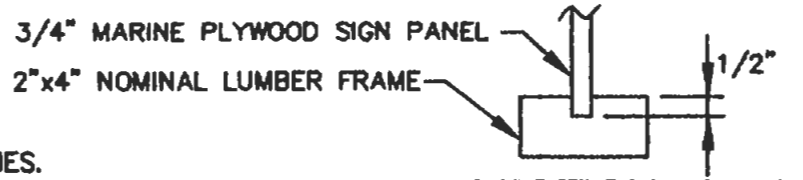
4'-0"

8'-0"

PROJECT SIGN

NOT TO SCALE

NOTE:
LETTERING AND FRAME SHALL BE DARK BLUE IN COLOR.
SIGN BACKGROUND SHALL BE WHITE IN COLOR.
TOP TWO LINES SHALL BE 4" LETTERS WITH A 2" SPACE BETWEEN LINES.
REMAINDER OF LINES SHALL BE 2" LETTERS WITH 1" SPACE BETWEEN LINES.
THE LEFT BORDER SHALL BE DETERMINED USING THE LONGEST LINE CENTERED ON THE SIGN PROVIDING EQUAL BORDERS.



SECTION A–A

NOT TO SCALE

ARTICLE 2(d)

M/WBE-EEO Utilization Plan

New York State Department of Environmental Conservation

(To be completed by each contractor/consultant and submitted to DEC for review)

Consultant/Contractor Name:		**Date:**	
Address:	**City:**	**State:**	**Zip:**
Name and Title of Authorized Representative:		**Signature of Authorized Representative:**	
Name and Title of M/WBE Representative:		**Signature of M/WBE Representative:**	
Contract Description:		**Contract Number:**	

Projected M/WBE and EEO Summary

	Percent	*$ Amount*		*Percent*	*Number of Employees*	*Work Hours*
1. Total Dollar value of the Prime Contract/product provided	**%**		**5. Total No. Employees and work hours**	**100%**		
2. MBE goal applied to the contract	**%**		**6. Total goal for minority employees**	**%**		
3. WBE goal applied to the contract	**%**		**7. Total goal for female employees**	**%**		

4. M/WBE combined totals	**%**		**8. EEO combined totals**	**%**

SECTION I - MBE INFORMATION **In order to achieve MBE goals, minority firms are expected to participate in the following manner:**

MBE Firm	*Description of Work to be Done by MBE*	*Projected Contact Amount & Award Date*	*Scheduled Contract Start Date*	*Contract Payment Schedule*	*Contract Completion Date*
Name *Address* *City* *ST/Zip* *Phone*		$ **Date:**			
Name *Address* *City* *ST/Zip* *Phone*					
Name *Address* *City* *ST/Zip* *Phone*					
Name *Address* *City* *ST/Zip* *Phone*		$ **Date:**			
Name		$			

Address *City* *ST/Zip* *Phone*		**Date:**			

SECTION II - WBE INFORMATION **In order to achieve WBE goals, minority firms are expected to participate in the following manner:**

WBE Firm	*Description of Work to be Done by MBE*	*Projected Contact Amount & Award Date*	*Scheduled Contract Start Date*	*Contract Payment Schedule*	*Contract Completion Date*
Name *Address* *City* *ST/Zip* *Phone*		$ **Date:**			
Name *Address* *City* *ST/Zip* *Phone*		$ **Date:**			
Name *Address* *City* *ST/Zip* *Phone*		$ **Date:**			

SECTION III - EEO INFORMATION **In order to achieve the EEO goals minorities and females are expected to be employed in the following job categories for the specified amount of work hours:**

		All Employees		*Minority Employees*			
Job Categories	*Total Work Hours of Contract*	*Males*	*Females*	*Black*	*Asian*	*Native American*	*Hispanic*
Officials/Managers							
Professional							
Technicians							
Sales Workers							
Office/Clerical							
Craftsmen							
Laborers							
Service/Workers							
TOTALS							

BIDDING & CONTRACT REQUIREMENTS

SECTION 00301

BIDDER'S CHECKLIST

(All pages of this color to be completed by
Bidder PRIOR to Bid Submission)

Bid Prices, Pages 00370-1 thru 00370-6: All blanks appropriately filled in ink with both words and figures. ☐

Bid Proposal, Pages 00371-1 and 00371-2: All blanks appropriately filled and signed. ☐

State and Federal Requirements: Each of the following forms must be executed:

NON-COLLUSIVE BIDDING CERTIFICATION, Page 00480-1: Requires Bidder's signature. ☐

STATEMENT OF SURETY'S INTENT, Page 00481-1: Requires completion and signature by Surety's Representative. ☐

BID SECURITY, Page 00499-1: Attach Bid Security to page labeled "BID SECURITY" (ATTACH HERE - CERTIFIED CHECK, CASH OR BID BOND). ☐

Acknowledgment of all Addenda ☐

NOTE: To Bid, the Bidder must fill in all pages this color.

END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00370

BID FOR CONSTRUCTION OF
CONTRACT NO. 1A - GENERAL CONSTRUCTION
CORTLAND COUNTY LANDFILL, REMEDIAL ACTION LANDFILL CLOSURE

TO THE COUNTY OF CORTLAND:

Pursuant to and in compliance with your Advertisement for Bids and the Information for Bidders relating thereto, the undersigned hereby offers to furnish all plant, labor, materials, supplies, equipment and other facilities and things necessary or proper for or incidental to the construction and completion of Contract No. 1A - General Construction, Cortland County Landfill, Remedial Action Landfill Closure, required by and in strict accordance with the applicable provisions of all Contract Documents for the following unit and lump sum prices:

DESCRIPTION	ESTIMATED QUANTITY	UNIT OR LUMP SUM PRICE WORDS	UNIT OR LUMP SUM PRICE FIGURES	TOTAL AMOUNT
SECTION 1 - LUMP SUM ITEMS 1.1 Mobilization/Demobilization (Payment Section 02002)	Lump Sum	_____ Dollars _____ Cents	$ _____	$ _____
1.2 Site Work (Payment Section 02003)	Lump Sum	_____ Dollars _____ Cents	$ _____	$ _____
1.3 Health & Safety Plan (Payment Section 02004)	Lump Sum	_____ Dollars _____ Cents	$ _____	$ _____

SECTION 00370

BID FOR CONSTRUCTION OF
CONTRACT NO. 1A - GENERAL CONSTRUCTION
CORTLAND COUNTY LANDFILL, REMEDIAL ACTION LANDFILL CLOSURE

DESCRIPTION	ESTIMATED QUANTITY	UNIT OR LUMP SUM PRICE WORDS	UNIT OR LUMP SUM PRICE FIGURES	TOTAL AMOUNT
1.4 Dust Control Plan (Payment Section 02005)	Lump Sum	_____ Dollars _____ Cents	$ _____	$ _____
1.5 Construction Quality Control Plan (Payment Section 02006)	Lump Sum	_____ Dollars _____ Cents	$ _____	$ _____
1.6 Erosion Sediment Control Plan (Payment Section 02007)	Lump Sum	_____ Dollars _____ Cents	$ _____	$ _____
1.7 Electrical (Payment Section 16999)	Lump Sum	_____ Dollars _____ Cents	$ _____	$ _____
SECTION 2 - UNIT PRICED ITEMS 2.0 Polyvinyl Chloride (PVC) Lining Material (Measurement and Payment Section 02595.4)	1,762,000 S.F.	_____ Dollars _____ Cents	$ _____	$ _____

SECTION 00370

BID FOR CONSTRUCTION OF
CONTRACT NO. 1A - GENERAL CONSTRUCTION
CORTLAND COUNTY LANDFILL, REMEDIAL ACTION LANDFILL CLOSURE

DESCRIPTION	ESTIMATED QUANTITY	UNIT OR LUMP SUM PRICE WORDS	UNIT OR LUMP SUM PRICE FIGURES	TOTAL AMOUNT
2.1 Linear Low Density Polyethylene (LLDPE) Lining Material (Measurement and Payment Section 02598.4)	1,762,000 S.F.	_____ Dollars _____ Cents	$ _____	$ _____
2.2 Geotextile (Measurement and Payment Section 02072.4)	1,762,000 S.F.	_____ Dollars _____ Cents	$ _____	$ _____
2.3 Select Fill - Type A (Measurement and Payment Section 02226.4)	64,000 C.Y.	_____ Dollars _____ Cents	$ _____	$ _____
2.4 Select Fill - Type B (Measurement and Payment Section 02226.4)	1,000 C.Y.	_____ Dollars _____ Cents	$ _____	$ _____
2.5 Select Fill - Type D (Measurement and Payment Section 02226.4)	100 C.Y.	_____ Dollars _____ Cents	$ _____	$ _____

SECTION 00370

BID FOR CONSTRUCTION OF
CONTRACT NO. 1A - GENERAL CONSTRUCTION
CORTLAND COUNTY LANDFILL, REMEDIAL ACTION LANDFILL CLOSURE

DESCRIPTION	ESTIMATED QUANTITY	UNIT OR LUMP SUM PRICE WORDS	UNIT OR LUMP SUM PRICE FIGURES	TOTAL AMOUNT
2.6 Common Fill (Measurement and Payment Section 02257.4)	95,000 C.Y.	_____ Dollars _____ Cents	$ _____	$ _____
2.7 Topsoil (Measurement and Payment Section 02484.4)	1,962,00 S.F.	_____ Dollars _____ Cents	$ _____	$ _____
2.8 Seeding (Measurement and Payment Section 02485.4)	1,962,000 S.F.	_____ Dollars _____ Cents	$ _____	$ _____
2.9 Landfill Gas Vents (Type B - Gas Vents (BGV)) (Measurement and Payment Section 13052.4)	125 EA.	_____ Dollars _____ Cents	$ _____	$ _____
2.10 Rotary Drilled Landfill Gas Vent Wells (Type A - Gas Vents (AGV)) (Measurement and Payment Section 02677.4.4.1)	1,390 L.F.	_____ Dollars _____ Cents	$ _____	$ _____

SECTION 00370

BID FOR CONSTRUCTION OF
CONTRACT NO. 1A - GENERAL CONSTRUCTION
CORTLAND COUNTY LANDFILL, REMEDIAL ACTION LANDFILL CLOSURE

DESCRIPTION	ESTIMATED QUANTITY	UNIT OR LUMP SUM PRICE WORDS	UNIT OR LUMP SUM PRICE FIGURES	TOTAL AMOUNT
2.11 Rotary Drilled Landfill Gas Vent Wells Above Ground Piping (Measurement and Payment Section 02677.4.4.2)	39 EA.	_____ Dollars _____ Cents	$ _____	$ _____
2.12 Augered Hole Abandonment (Measurement and Payment Section 13997)	150 L.F.	_____ Dollars _____ Cents	$ _____	$ _____
2.13 Miscellaneous Excavation (Measurement and Payment Section 02220.4.2)	500 C.Y.	_____ Dollars _____ Cents	$ _____	$ _____
2.14 Rock Excavation (Measurement Payment Section 02220.4.11)	50 C.Y.	_____ Dollars _____ Cents	$ _____	$ _____
2.15 Drum Removal, Staging and Disposal (Measurement & Payment Section 13996)	20 EA.	_____ Dollars _____ Cents	$ _____	$ _____

SECTION 00370

BID FOR CONSTRUCTION OF
CONTRACT NO. 1A - GENERAL CONSTRUCTION
CORTLAND COUNTY LANDFILL, REMEDIAL ACTION LANDFILL CLOSURE

DESCRIPTION	ESTIMATED QUANTITY	UNIT OR LUMP SUM PRICE WORDS	UNIT OR LUMP SUM PRICE FIGURES	TOTAL AMOUNT
2.16 Granular Fill (Measurement & Payment Section 02222)	4,600 CY	_____ Dollars _____ Cents	$ 10	$ 46,000

ALTERNATIVE 1: PVC LINER Total (all inclusive of items: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.0, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16)	**ALTERNATIVE 1:** TOTAL BID $ 4,998,520 (Price in Figures) Say $ 4,999,000
ALTERNATIVE 2: LLDPE LINER Total (all inclusive of items: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16)	**ALTERNATIVE 2:** TOTAL BID $ 4,822,320 (Price in Figures) Say $ 4,822,000
By signature of authorized individual below, the Bidder acknowledges the following alterations and addenda have been made and included to this Contract. Signature : _____ _____ _____ _____	

END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00371

BID

The signer of this Proposal as Bidder declares that the only person, persons, company or parties interested in the proposal are named in this Proposal; that the Bid is made without any connection with any person making another Bid for the same Contract; that the Bid is in all respects fair and without collusion or fraud; that no officer, agent or employee of the Owner is directly or indirectly interested in the Bid; and that he has carefully examined the annexed form of Contract and Contract Documents.

In accordance with Section 139-d of the State Finance Law, Section 103-d of the General Municipal Law, or Section 2878 of the Public Authorities Law, the Bidder further certifies that: (a) the Bid has been arrived at by the Bidder independently and has been submitted without collusion with any other vendor of materials, supplies or equipment of the type described in the invitation for Bids; and (b) the contents of the Bid have not been communicated by the Bidder nor, to its best knowledge and belief, by any of its employees or agents, to any person not an employee or agent of the Bidder or its surety on any bond furnished herewith prior to the official opening of the Bid. Section 620 of the Penal Law makes violation of this statute a crime punishable as perjury.

If written notice of the Award of this Bid is delivered to the undersigned within forty-five (45) days after the date of opening of the Bids, or any time thereafter before this Bid is withdrawn, the undersigned will, within five (5) days after the date of delivering of such notice, execute and deliver a contract in the form of Contract attached hereto.

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

_____

_____

The undersigned further agrees to comply with the requirements as to conditions of employment, wage rates and hours of labor set forth in the Contract Documents.

This bid may be withdrawn at any time prior to the scheduled time for the opening of bids or any authorized postponement thereof.

SECTION 00371

BID

Accompanying this Bid, is a Bid security in the form of a certified check*, cash*, or a bid bond* for the sum of _____ ($_____) Dollars. In case this Bid is accepted by the Owner, and the undersigned shall fail to execute a contract with and give the required bonds to the Owner within five (5) days after the date of a written notice by the Owner to the undersigned so to do, this Bid security shall be forfeited and will be retained by the Owner as liquidated damages.

Dated _____, 20____ **_____

_____

_____

_____

Signature of Bidder

Print Name of Signer of Bid _____

Address _____

_____

* Cross out designations not applicable.

** Insert bidder's name; if a corporation, give the state of incorporation using the phrase "a corporation organized under the law of"; if a partnership, give the name of the partners, using also the phrase "co-partners trading and doing business under the firm name and style of"; if an individual using a trade name, give individual name, using also the phrase "an individual doing business under the firm name and style of".

END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00480

NON-COLLUSIVE BIDDING CERTIFICATION

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

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

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

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

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

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

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

FIRM: _____

By: _____

Title: _____

(CORPORATE SEAL IF ANY)

END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00481

STATEMENT OF SURETY'S INTENT

To: _____

We have reviewed the Bid of _____
(Contractor)

of _____
(Address)

for _____

_____
(Project)

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

and wish to advise that should this Bid of the Contractor be accepted and the Contract awarded to him, it is our present intention to become surety on the Performance Bond and Labor and Materials Payment Bond required by the Contract.

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

We are duly authorized to transact business in the State of New York, and we appear on the U.S. Treasury Department's most current list (Circular 570 as amended).

Attest:

_____ _____

_____
Surety's Authorized Signature(s)

Attach Power of Attorney

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

END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00499

BID SECURITY

(ATTACHED HERE - CERTIFIED CHECK, CASH OR BID BOND)

END OF SECTION

BIDDING & CONTRACT REQUIREMENTS

SECTION 00570

AGREEMENT

This CONTRACT, in six (6) copies, made and entered into this _____ day of _____ _____, 20___, by and between the _____, a municipal corporation, organized and existing under the laws of the State of New York, with its principal office and place of business located at _____, hereinafter designated as "Owner", Party of the First Part,

and_____

_____

_____ of _____

County of _____State of _____

hereinafter designated as the Contractor, Party of the Second Part.

WITNESSETH: That the parties hereto, each in consideration of the Agreements on the part of the other herein contained, have mutually agreed, and hereby mutually agree, the Party of the First Part for itself and its successors, and the Party of the Second Part for itself, himself or themselves and its successors, his or their executors, administrators and assigns as follows:

Article 1. DESCRIPTION. Under this Agreement and Contract, the Contractor shall furnish all materials and perform all work required to furnish and install complete Contract No._____ - _____ Construction for Cortland County Landfill Remedial Action Landfill Closure.

Article 2. In consideration of the payments to be made as hereinafter provided, and of the performance by the Owner of all matters and things to be performed by the Owner as hereinafter provided, the Contractor agrees, at his own sole cost and expense to perform all the labor and services, and to furnish all the labor and materials, plant and equipment necessary to complete, and to complete in good, substantial, workmanlike and approved manner, the work described under Article 1 hereof, within the time hereinafter specified and in accordance with the terms, conditions and provisions of this Contract and with the instructions, order and directions of the Engineer made in accordance with this Contract.

SECTION 00570

AGREEMENT

Article 3. The Owner agrees to pay and the Contractor agrees to accept, as full compensation for all work done and materials furnished, and also for all costs and expense incurred, and loss or damages sustained by reason of the action of the elements or growing out of the nature of the work, or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, and for all risks of every description connected with the work, and for all expenses incurred by, or in consequence of, the suspension or discontinuance of the work as herein specified, and for well and faithfully completing the work, and the whole thereof, as herein provided, and for maintaining the work in good condition until the final payment is made, the prices stipulated in the proposal hereto attached.

Article 4. CONTRACT DOCUMENTS. The following Documents shall constitute integral parts of the Agreement, the whole to be collectively known and referred to as the Contract: Advertisement For Bids, Information for Bidders, Wage Rates, Additional Instructions, Bid Documents, Agreement, Performance Bond, Labor & Materials Payment Bond, Insurance Certificates, General Conditions, General Requirements, Specifications, Contract Drawings, and all interpretations of, or addenda to the CONTRACT DOCUMENTS issued by the Owner or the Engineer with the approval of the Owner.

The Table of Contents, Indices, Headings, Titles contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretations of the provisions to which they refer.

Article 5. Contractor agrees to comply with all requirements of the Contract Documents and with all provisions of law and implementing regulations. If the Contractor shall fail to comply with any of the terms, conditions, provisions, or stipulations of this Contract, then the Owner may make use of any or all remedies at law or in equity, or as provided in the Contract and shall have the right and power to proceed in accordance with the provisions thereof.

Article 6. The following alterations and addenda have been made and included in this Contract before it was signed by the parties hereto:

_____

_____

_____

SECTION 00570

AGREEMENT

Article 7. This agreement shall be construed and enforced in accordance with the laws of the State of New York.

Article 8. The Contractor agrees:

(a) He hereby voluntarily and irrevocably submits himself to the jurisdiction and venue of any court of competent jurisdiction over the subject matter of this Contract located within the State of New York in which any litigation is brought based on or arising out of this Contract.

(b) Any litigation brought by the Contractor based on or arising out of this Contract shall be brought only in the Supreme Court of the State of New York within the County in which the Owner is located.

(c) Any legal process or notice connected with any litigation may be served on the Contractor by United States registered mail, postage pre-paid, addressed to the Contractor at his address stated in this Contract or at the Address stated in this Contract for the furnishing of notices to the Contractor or at the Contractor's last known address, and that service in such manner shall constitute good and valid service of process upon the Contractor.

(d) The Contractor hereby waives any defense which might be available to it in any such litigation based on or alleging lack of jurisdiction or venue, or, if process is served in the manner provided in Subparagraph (c) immediately above, invalid service of process, and that he will duly enter his appearance in any such action.

(e) This Contract may be presented in court as conclusive evidence of the foregoing agreement.

SECTION 00570

AGREEMENT

IN WITNESS WHEREOF, the parties to this Agreement have hereunto set their hands and seals and have executed this Agreement in six (6) copies the day and year first above written.

_____ (OWNER)

(Seal) By: _____

CONTRACTOR

_____

(Seal) By: _____

SECTION 00570

AGREEMENT

(ACKNOWLEDGMENT OF OFFICER OF OWNER ATTESTING CONTRACT)

State of _____)
) SS:
County of _____)

On this _____ day of _____, 20____, before me personally came and appeared _____to me known, who, being by me duly sworn, did depose and say that he is the _____ of the _____described in and which executed the foregoing instrument; that he knows the seal of said Owner; that one of the impressions appearing on said instrument is a true and correct impression of such seal; and that he affixed it thereto and attested the same over his signature by virtue of the authority in him vested.

_____

(ACKNOWLEDGMENT OF CONTRACTOR, IF A CORPORATION)

State of _____)
) SS:
County of _____)

On this _____ day of _____, 20____, before me personally came and appeared _____to me known, who, being by me duly sworn, did depose and say that he resides at _____ _____; that he is the _____ of _____, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

_____

SECTION 00570

AGREEMENT

(ACKNOWLEDGMENT OF CONTRACTOR, IF A PARTNERSHIP)

State of _____)
) SS:
County of _____)

On this _____ day of _____, 20____, before me personally came and appeared _____to me known and known to me to be one of the members of the firm of _____ described in and who executed the foregoing instrument, and he acknowledged to me that he executed the same as and for the act and deed of said firm.

_____

(ACKNOWLEDGMENT OF CONTRACTOR, IF AN INDIVIDUAL)

State of _____)
) SS:
County of _____)

On this _____ day of _____, 20____, before me personally came and appeared _____to me known and known to me to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same.

_____

SECTION 00570

AGREEMENT

(ACKNOWLEDGMENT OF CONTRACTOR, IF A LIMITED LIABILITY COMPANY)

State of _____)
) SS:
County of _____)

On this _____ day of _____, 20____, before me personally came and appeared _____, to me known, who being by me duly sworn, did depose and say that he resides at _____ _____; that he is the _____ of _____, the limited liability company described in and which executed the foregoing instrument; that he knows the seal of said limited liability company; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the managing members of said limited liability company, and that he signed his name thereto by like order.

_____

SECTION 00570

AGREEMENT

(Certification of Owner's Attorney)

I, the undersigned, the duly authorized and acting legal representative of _____ _____ do hereby certify as follows:

I have examined the foregoing Contract and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions and provisions thereof.

By: _____
Owner's Attorney

_____
(Date)

END OF SECTION

BIDDING & CONTRACT DOCUMENTS

SECTION 00610

PERFORMANCE BOND

(ATTACH PERFORMANCE BOND HERE)

BIDDING & CONTRACT REQUIREMENTS

SECTION 00620

LABOR & MATERIALS PAYMENT BOND

(ATTACH LABOR & MATERIALS PAYMENT BOND HERE)

BIDDING & CONTRACT REQUIREMENTS

SECTION 00650

CERTIFICATE OF INSURANCE

(ATTACH INSURANCE CERTIFICATES HERE)

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, P.C., Consulting Engineers, 290 Elwood Davis Road, Box 3107, Syracuse, New York 13220, 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 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. The policies and certificates shall be in form and content satisfactory to the Owner, shall show compliance by the Contractor with the provisions herein contained, and shall provide that the policies shall not be cancelled or altered until after 30 days written notice to the Owner. Property damage insurance shall in all cases include coverage for XCU hazards, (explosion, collapse and underground operations).

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 if the Project is abandoned or deferred.

Unless specifically required otherwise elsewhere in the Contract Documents, commercial general liability insurance policies shall be provided in amounts not less than:

Bodily Injury and Property Damage Liability:	$1,000,000 Each Occurrence $2,000,000 General Aggregate $2,000,000 Products Aggregate
Personal Injury Liability:	$1,000,000 Each Occurrence

The kinds and amounts of insurance required are:

A. Worker's Compensation Insurance

A policy covering the Contractor's obligations in compliance with the Worker's Compensation Law (Chapter 41 of the Laws of 1914, as amended) covering all operations of the work, whether performed by the Contractor or by Subcontractors. This Contract shall be null and void, and of no effect unless the Contractor provides during the life of the Contract compensation coverage for the benefit of his employees, and those of his Subcontractors, in compliance with the Worker's Compensation Law (State Finance Law, Section 142). The Contractor shall require each Subcontractor to also comply with these requirements, unless the Subcontractor's employees are adequately covered by the Contractor's policy. If any employees are not covered by the Worker's Compensation Law due to being engaged in a hazardous type of work, the Contractor shall provide adequate Employer's General Liability Insurance for their protection.

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.03 CONTRACTOR'S INSURANCE - Continued

B. Commercial General Liability Insurance

This policy shall cover all damages arising during the policy period, and shall include but not be limited to:

1. Contractor's Liability Insurance issued to and covering the liability for damages imposed by law upon the Contractor with respect to all work performed by him under the Contract.

2. Contractor's Liability Insurance issued to and covering the liability for damages imposed by law upon each Subcontractor with respect to all work performed by him under the Contract.

3. Contractor's Protective Liability Insurance issued to and covering the liability for damages imposed by law upon the Contractor with respect to all work under the Contract performed for the Contractor by Subcontractors.

4. Completed Operations Liability Insurance issued to and covering the liability for damages imposed by law upon the Contractor and each Subcontractor arising during the period between the date of the Notice of Certificate of Substantial Completion and one year thereafter.

5. Product Liability Insurance issued to and covering the liability for damages imposed by law upon the Contractor arising, after physical possession of the products has been relinquished, out of the Contractor's products or reliance upon a representation or warranty with respect thereto.

6. Contractual Liability Insurance issued to and covering the liability for damages imposed by law upon the Contractor, assumed under this Contract.

C. Owners Protective Liability Insurance issued in the name of the Owner to and covering the liability for damages imposed by law upon the Owner and the Engineer with respect to all operations under the Contract by the Contractor or his

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.03 CONTRACTOR'S INSURANCE - Continued

Subcontractors, including supervisory acts and omissions of the Owner. If so stated in the Additional Instructions, this insurance shall also name as additional assured or assureds the party or parties specified in the Additional Instructions.

The limit for this coverage shall be $1,000,000 per occurrence and aggregate.

D. Contractual Liability Insurance issued to and covering the liability imposed by the Contract upon the Owner and the Engineer for work performed on private lands with respect to the work of the Contract by the Contractor or his Subcontractors. Such insurance is specified in more detail in the Additional Instructions.

E. Automobile Liability Insurance covering all claims against the Contractor, Subcontractors, Engineer and Owner as the result of work under the Contract.

The limit for this coverage shall be $1,000,000 per occurrence.

F. Property Insurance - Fire & Extended Coverage

The Contractor shall provide and maintain, at his own expense, a standard Property Insurance - Fire & Extended policy including special peril and theft to insure all work of the Contract against any loss or damage. The value of the insurance shall at all times be equal to or greater than the full value of the work (on-site & off-site) shall be in the names of both the Owner and the Contractor, payable to the Owner, and any proceeds thereof 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.

G. Umbrella Liability Insurance coverage shall be provided for a limit of at least $4,000,000 and shall cover over the areas of Commercial General Liability, Contractual Liability and Automobile Liability coverage.

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 General Corporation Law, with specific reference to the requirements in Section 210 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.

The Contractor shall fully protect, defend, indemnify and save harmless the Owner and the Engineer and their employees and agents against all liability, costs, judgments, damages, penalties and expenses, including reasonable attorney fees in connection with any claims relating to or arising out of the work, whether such claims, damages or injury are attributable to the negligence of the Contractor, his officers, his Subcontractor's, employees or agents or otherwise. The liability of the Contractor is absolute and is not dependent upon any question of negligence on the part of the Contractor, his employees, officers or agents.

SECTION 00753

STATUS OF CONTRACTOR

00753.06 GENERAL INDEMNIFICATION

The Contractor shall fully protect, defend, indemnify and hold harmless the Owner and Engineer and their agents against all liability, judgments, damages, cost and expense, including reasonable attorneys fees, arising from any and all claims relating to labor and material furnished in connection with the work because of the failure, omission or neglect of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of the above may be liable, to perform any of the acts, covenants or other matters required of him under the Contract.

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 the Owner, the 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.

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.

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 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

SECTION 00756

TIME ELEMENTS

00756.06 TIME EXTENSIONS - Continued

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).

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.

SECTION 00756

TIME ELEMENTS

00756.07 ENGINEERING AND INSPECTION CHARGES - Continued

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.

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.

SECTION 00756

TIME ELEMENTS

00756.08 PER DIEM CHARGES FOR DELAY - Continued

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

C. 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 00150.05, 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:

00150.02	NON-DISCRIMINATION
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 unhealthly 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 during review do not relieve the Contractor from compliance with the requirements of the Contract Drawings and Specifications.

Within thirty days of the execution of the Agreement, the Contractor shall submit five copies of 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.

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.

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

1. No Exceptions Taken
2. Make Corrections Noted
3. Amend and Resubmit
4. Rejected - See Remarks

SECTION 01340

SUBMITTALS

01340.02 TRANSMITTAL, IDENTIFICATION AND RESUBMITTAL - Continued

Upon return of a submittal marked "No Exceptions Taken" or "Make Corrections Noted", the Contractor may order, ship or fabricate the materials so noted. A submittal marked "Make Corrections Noted" should not be resubmitted for further review. Submittals marked "Amend and 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 - See Remarks" 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.

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.

SECTION 01340

SUBMITTALS

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:

"Or-Equal": If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and acceptance 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.

SECTION 01340

SUBMITTALS

01340.07 SUBSTITUTES AND "OR-EQUAL" ITEMS - Continued

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 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 acceptance 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 and acceptance of the proposed substitute will prejudice Contractor's achievement of Substantial Completion on time, whether or not acceptance of 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.

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 "No Exceptions Taken" or "Make Corrections 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.

SECTION 01340

SUBMITTALS

01340.08 ADDITIONAL ENGINEERING COSTS - Continued

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, hay bale strainers, 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 minimize 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 in conjunction with earthwork operations or as soon thereafter as practicable. The area of bare soil exposed at any one time by construction operations shall be kept to a minimum.

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 minimal sediment will enter streams or other bodies of water. Waste or disposal areas and construction roads shall be located and constructed in a manner that will minimize 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, such areas shall be separated from the main stream by a dike or other barrier to minimize sediment entering a flowing stream. Care shall be taken during the construction and removal of such barriers to minimize the muddying of a stream.

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 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.

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.

SECTION 01568

EROSION AND SEDIMENT CONTROL

01568.03 CONTROL MEASURES - Continued

G. All applicable regulations of 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 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

MAINTENANCE OF TRAFFIC

01577.01 GENERAL

This work shall consist of maintaining traffic and protecting the public from damage to person and property within the limits of and for the duration of the Contract.

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

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

MAINTENANCE OF TRAFFIC

01577.04 PAYMENT

Unless a specific payment item is included in the Bid, payment for 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, and the Contractor shall furnish and deliver to the laboratory all requisite samples. Documentary evidence that materials pass the required inspection and tests shall be furnished to the Engineer by the Contractor 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 shall be selected by the Contractor, who shall 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

SPECIFICATIONS

SECTION 02002

MOBILIZATION/ DEMOBILIZATION

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Item, the Contractor shall furnish all labor, materials and equipment required to perform the work described below and required to implement the construction.

2.1 WORK INCLUDED:

2.1.1 In addition to the applicable provisions of Section 00100 thru and including 01640, and other Divisions of this project, the following describes the principal items of work to be performed under this payment item:

- Set up the necessary general plant, including shops, storage areas, office and such sanitary and other facilities as are required by local or State law or regulation.
- The cost of required insurance/bonds and/or any initiation of the Contract work is also included in this Item.
- The Contractor shall pay for all of the cost associated with all utilities and maintenance of his field office trailer.
- Acquisition of permits not otherwise specified under other payment items.
- Mobilization and demobilization of all equipment and personnel not otherwise included in other payment items.
- Cost of required insurance and/or any initiation of the Contract work is also included in this Item.
- All PPE and associated and safety equipment.
- All necessary health and safety requirements.

SECTION 02002

MOBILIZATION/ DEMOBILIZATION

- Engineers field office trailer including local and long distance telephone charges resulting from use of either of two telephone lines to be provided.

- The Contractor shall pay for all of the cost associated with all utilities and maintenance of the field office trailer.

- Costs associated with all submittals.

- Decontamination of all equipment and personnel.

3.1 BASIS OF PAYMENT

3.1.1 Fifty percent (50%) of the amount bid shall be made payable to the Contractor whenever he shall have completed ten percent (10%) of the Contract work. Ten percent (10%) of the work shall be considered completed when the total of payments earned, as reflected by estimates of work done, not including the amount bid for this Item, nor payments for materials delivered to the site exceeds ten percent (10%) of the total amount of the bid for this Contract. The remaining 50% of the amount bid shall be made payable to the Contractor in equal monthly payments prior to substantial completion of the work with substantial completion being as defined in the Contract Documents.

END OF SECTION

SPECIFICATIONS

SECTION 02003

SITE WORK

1.1 DESCRIPTION:

1.1.1 Under this Section the Contractor shall furnish all services and materials and construct the structures and appurtenant facilities; shall furnish, install, test, place into satisfactory operation and maintain until final acceptance the equipment, piping and systems pertinent thereto; and shall fully complete the work of lump sum items, as shown, specified, scheduled and directed.

The principal items of work scheduled herein are included under this Section. The work of this Section also includes all accessories, appurtenances and other work required to complete this Contract, except those related to the work of these items but specifically included under other payment item sections of this Contract or under other contracts and all work shown on the Drawings and not included elsewhere.

The schedules and estimates of the work which may be included have been shown solely for the convenience of the Owner, Engineer and Contractor, and do not necessarily include all of the items of work which are shown and specified and which are required under this Contract.

2.1 WORK INCLUDED:

2.1.1 Work under this Item shall generally be comprised of but not limited to:

Item	Estimated Quantity
Clearing and Grubbing	50 Acres
Topsoil Stripping	50 Acres
Area 1 - Refuse Removal/Relocation Grade to Free Drain	63,000 C.Y.
Area 3 - Excavation and Site Hauling of Waste in Abandoned City of Cortland Landfill	4,200 CY
Liner Subsurface Preparation	50 Acres
Type II Ditches	620 L.F.

SECTION 02003

SITE WORK

Item	Estimated Quantity
Type III Ditches	4,550 L.F.
Side Slope Diversion Berm	2,950 L.F.
Area 2 - Refuse/Relocation & On-Site Disposal of Isolated Contaminated Soils	23,000 C.Y.
All required material testing as ordered by Engineer	
Landfill Perimeter Trenches and Toe Drains	
Sanitary Holding Tank and All Associated Piping (Exterior Sanitary Sewer System)	
All Culvert Pipes and Specials	
All Miscellaneous Piping	
Waterline Relocation	
Turf Reinforcement Mat (TRM)	
Gas Migration Barrier Trench & Vent System (See Detail Sheet G-6)	

3.1 RELATED WORK NOT INCLUDED

3.1.1 The following items of work closely related to site work specifically not included under this Item:

- Mobilization/Demobilization

4.1 PAYMENT

4.1.1 Payment for the work of lump sum items will be made at the Contractor's lump sum prices stated in the Bid and appropriate to each item included under this Section.

4.1.2 No payment will be made under this Section for work performed by the Contractor to replace defective work, or for work which is not shown or ordered, or which is outside the limits shown or ordered.

END OF SECTION

SPECIFICATIONS

SECTION 02004

HEALTH AND SAFETY PLAN

1.1 DESCRIPTION:

1.1.1 Under this Item, the Contractor shall furnish all labor materials, and equipment required to develop and implement a Health and Safety Plan in accordance with the Contract Specifications.

2.1 WORK INCLUDED:

2.1.1 The work of this Payment Item shall include preparation of an acceptance Health and Safety Plan and all work required to implement the Health and Safety Plan including, but not limited to the following:

- Health and Safety Risk Evaluation
- Employee training and qualifications
- Medical Surveillance
- Engineering and Work Practice Controls
- Provision of Personal Protective Equipment required by Contractor, Subcontractor, Engineer, Owner and Oversight Personnel
- Frequency and Types of Monitoring
- Site Control Measures
- Decontamination Procedures
- Site Standard Operating Procedures
- Confined Space Operations (when applicable)
- Spill Containment (when applicable)
- Emergency Response Plan
- Fire Prevention and Protection
- Drum and Container Handling Operations

3.1 RELATED WORK NOT INCLUDED:

3.1.1 The following Items of work closely related to the Health and Safety Plan are specifically not included under this Item:

- Dust Control Plan

SECTION 02004

HEALTH AND SAFETY PLAN

4.1 BASIS OF PAYMENT

4.1.1 Payment of 25% of the Bid Amount for development of the Health and Safety Plan shall be made upon its acceptance of the Health and Safety/Plan.

Payments for implementation of the Health and Safety Plan will be made in equal monthly installments based on 75% of the bid amount. The duration of payments will be calculated based on the period of time following acceptance of the Health and Safety Plan to the completion date identified using the calendar days identified in the Bid or as amended by any Contract time extensions.

END OF SECTION

SPECIFICATIONS

SECTION 02005

DUST CONTROL PLAN

1.1 DESCRIPTION:

1.1.1 Under this Item, the Contractor shall furnish all material, labor and equipment required to develop and implement a perimeter air monitoring and dust control plan in accordance with the Contract Specifications.

2.1 WORK INCLUDED:

2.1.1 The work of this Payment Item includes preparation and implementation of an acceptable Dust Control Plan as specified or as directed by the Engineer including, but not limited to:

- Furnishing and operating all air monitoring equipment
- Implement procedures to identify and quantify airborne levels of hazardous substances.
- Select and evaluate the effectiveness of engineering controls, work practices, and personal protective equipment.
- Establish upwind and downwind perimeter air monitoring stations in accordance with the Contract Specifications.
- Perform air monitoring in accordance with the Contract Specifications.
- Provide all air monitoring records to the Engineer on a daily basis.
- Implement dust control procedures.
- The control of fugitive dust created as a result of this project shall be the obligation of the Contractor. Notwithstanding the requirements of the Contract Documents, the Contractor shall also comply with the requirements of OSHA 29 CFR 1910.1000.

SECTION 02005

DUST CONTROL PLAN

3.1 RELATED WORK NOT INCLUDED:

3.1.1 The following items of work closely related to the Air Monitoring Plan are specifically not included under this item:

- Health and Safety Plan

  a. Plan Development (25%)
  b. Implementation (75%)

4.1 BASIS FOR PAYMENT:

4.1.1 Payment of 25% of the Bid Amount for preparation of the Dust Control Plan shall be made upon its acceptance.

Payments for implementation of the Dust Control Plan will be made in equal monthly installments based on 75% of the bid amount. The duration of payments will be calculated based on the period of time following acceptance of the Health and Safety Plan to the completion date identified using the calendar days identified in the Bid, or as amended by any Contract Time Extensions. Recalculated monthly payments will take effect the month following any Contract extension.

END OF SECTION

SPECIFICATIONS

SECTION 02006

CONSTRUCTION QUALITY CONTROL PLAN

1.1 DESCRIPTION:

1.1.1 Under this Item, the Contractor shall furnish all materials, labor and equipment required to develop implement a Construction Quality Control Plan in accordance with the Contract Specifications.

2.1 WORK INCLUDED:

2.1.1 The work of this Item includes preparation and implementation of an acceptance Construction Quality Control (CQC) Plan as specified or as directed by the Engineer including, but not limited to:

- Implementation of construction quality assurance and control procedures.
- Preparation and submittal of documentation related to CQC Plan.

3.1 RELATED WORK NOT INCLUDED:

3.1.1 The following items of work closely related to the CQC Plan are specifically not included under this Item:

- CQC specified and required under other items.

4.1 BASIS FOR PAYMENT:

4.1.1 Payment of 10% of the total Bid Amount for preparation of the CQC Plan be made upon acceptance of the CQC Plan.

Payments for implementation of the CQC Plan will be made in equal monthly installments based on 90% of the bid amount. The duration of payments will be calculated based on the period of time following acceptance of the CQC Plan to the completion date identified using the calendar days identified in Bid Form, or as amended by any Contract time extension.

SECTION 02006

CONSTRUCTION QUALITY CONTROL PLAN

1.5 BASIS FOR PAYMENT - Continued

No payment will be made under this Payment Item for laboratory and field testing specifically included in other Payment Items.

No payment will be made under this Item for work performance not in accordance with the CQC Plan.

END OF SECTION

SPECIFICATIONS

SECTION 02007

EROSION AND SEDIMENT CONTROL PLAN

1.1 DESCRIPTION:

1.1.1 Under this Item, the Contractor shall furnish all labor, materials and equipment required to develop and implement an acceptable Erosion and Sediment Control Plan (ESCP), complete as shown, specified, scheduled or directed.

2.1 WORK INCLUDED:

2.1.1 Work under this Item shall generally be comprised of, but not limited to, the following:

- Development of an ESCP in accordance with current regulations.
- Implementation of the ESCP in accordance with current regulations.
- Obtaining required permits.
- Installation and maintenance of erosion control structures and measures.
- All submittals to the Engineer as shown or specified.

3.1 RELATED WORK NOT INCLUDED:

3.1.1 The following item of work closely related to the Erosion and Sediment Control Plan are specifically not included under this Item:

- Construction Quality Control Plan.

SECTION 02007

EROSION AND SEDIMENT CONTROL PLAN

4.1 BASIS OF PAYMENT

4.1.1 Payment of 15% of the Bid Amount for preparation of the ESCP shall be made upon acceptance of the ESCP.

Payments for implementation of the ESCP will be made in equal monthly installments based on 85% of the bid amount. The duration of payments will be calculated based on the period of time following acceptance of the ESCP to the complete date identified using the calendar days identified on Bid Form or as amended by any Contract time extensions.

No payment will be made under this Item for work performed by the Contractor to replace defective work, or for work which is not shown or ordered, or which is outside the limits shown or ordered.

END OF SECTION

SPECIFICATIONS

SECTION 02072

GEOTEXTILE

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.1.2 The Contractor shall furnish and install the geotextile as shown on the Contract Drawings, or as directed by the Engineer. The geotextile layers will be incorporated into the landfill system to serve as protective and filtration layers.

1.2 SUBMITTALS:

1.2.1 Prior to the installation or delivery of a geotextile, the Contractor shall submit to the Engineer, from the geosynthetic manufacturer, a list of guaranteed "minimum average roll values" (MARV) for the geotextile (the minimum average roll value is the minimum value obtained from the average values of the sampled rolls). The Contractor shall provide the Engineer, from the manufacturer, a written certification stating that the geosynthetic material meets or exceeds the guaranteed properties submitted.

1.2.2 In addition to submitting guaranteed physical properties, the Contractor shall submit to the Engineer, from the manufacturer, documentation demonstrating the chemical compatibility of the geosynthetic material. Such documentation shall include chemical compatibility testing results.

1.2.3 Prior to delivery of the geotextile, the Contractor shall submit a sample of the warranty to be provided as described in paragraph 3.3.1.

1.3 DELIVERY:

1.3.1 All geotextiles will be inspected on delivery, and materials that do not comply with the Specification will be rejected. The Contractor shall furnish all labor required to handle the geotextiles during inspection and shall remove the rejected material from the site of the work.

SECTION 02072

GEOTEXTILE

1.4 CONFORMANCE TESTING:

1.4.1 Within one week of delivery and at the Engineer's direction, the Contractor shall provide the necessary labor, tools and equipment to obtain samples and send these samples to an independent quality assurance laboratory for testing at the Contractor's expense. At a minimum, the following tests will be performed on all geotextiles:

- mass per unit area - ASTM D5261
- burst strength - ASTM D3786
- grab strength - ASTM D4632
- puncture strength - ASTM D4833
- trapezoidal tear strength - ASTM D4533

1.4.2 Samples will be taken by cutting along the width and 5 feet from the end of a rolled or folded geotextile material. The sampling frequency for the geotextile will be one sample per every 100,000 square feet of respective material delivered.

1.4.3 Any samples which fail the conformance testing will require the failed material to be removed from the site and replaced with new material at the Contractor's expense.

1.4.4 For each lot number of geotextile (both Type I and Type II) that arrives at the site, a sample shall be taken by the Contractor and provided to the Owner for archiving. This sample shall be 3 feet long by the width of the rolled or folded geotextile.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 Geotextile:

2.1.1.1 The geotextile to be utilized shall be a nonwoven, needle-punched, polymeric geotextile. The fibrous structure of the geotextile must be able to withstand handling, placement and long-term loads associated with the incorporated Specifications.

SECTION 02072

GEOTEXTILE

2.1.1.2 The geotextile shall be protected from ultraviolet light, precipitation, mud, dirt, excessive dust, puncture, cutting and/or other damaging condition prior to and during delivery. The geotextile shall be capable of withstanding 30 days of sunlight without measurable deterioration.

2.1.1.3 Two types of nonwoven geotextiles will be supplied by the Contractor. Both fabrics shall be similar materials except for the weight and the associated physical properties. Type I will be nominal six oz./square yard or heavier, and Type II will be a nominal sixteen oz./square yard or heavier fabric. An equivalent substitution may be made subject to the approval of the Engineer. Geotextile Specifications are given in Paragraph 2.2.

2.1.1.4 All geotextiles shall be delivered on site in rolls contained within opaque plastic covers. These rolls will be tagged and display the following information.

- Manufacturer's name
- Product identification
- Lot number
- Roll number and dimensions

2.2 MINIMUM SPECIFIED VALUES:

2.2.1 Geotextile Minimum Average Roll Value (MARV) Specifications:

2.2.1.1 The table below lists the MARV specification values for the Type I and Type II nonwoven geotextiles. In addition, the typical average specification values, as indicated, have been listed. Final approval of the geotextile properties shall be made by the Engineer based upon Contractor's submittals.

SECTION 02072

GEOTEXTILE

Non-Woven Geotextiles

Property	Specification Limit Type I	Type II	Test Method
*Mass per Unit Area (oz/yd^2)	6.0	16.0	ASTM D5261
*Thickness (mils)	60	160	ASTM D5199
**Apparent Opening Size (US Sieve)	70-100	100-140	CW-02215 or ASTM D4751
*Burst Strength (psi)	220	575	ASTM D3786
*Grab Strength (lbs)	145	330	ASTM D4632
*Grab Elongation (%)	50	50	ASTM 04632
*Puncture Strength (lbs)	75	170	ASTM D4833
*Trapezoidal Tear Strength (lbs)	50	120	ASTM D4533
**Wide-Width Strength (lbs/in)	73	135	ASTM D4595
*Permittivity (sec^{-1})	1.5	0.4	ASTM D4491
*Water Flow Rate (gpm/ft^2)	90	40	ASTM D4491

*MARV Values Taken Along Weakest Principal Direction.
**Typical Average Values

SECTION 02072

GEOTEXTILE

PART 3 - EXECUTION

3.1 GEOTEXTILE INSTALLATION:

3.1.1 The following procedures and requirements will be followed during the installation of geotextile.

3.1.2 Placement:

3.1.2.1 The placement of the geotextile shall not be conducted during adverse weather conditions. The geotextile will be kept dry during storage and up to the time of deployment. During windy conditions, all geotextiles will be secured with sandbags or an equivalent approved anchoring system. Removal of the sandbags or equal will only occur upon placement of an overlying soil layer.

3.1.2.2 Proper cutting tools shall be used to cut and size the geotextile materials. Extreme care will be taken while cutting in-place geotextiles.

3.1.2.3 During the placement of geotextiles, all dirt, dust, sand or mud shall be kept off to prevent clogging. If excessive contaminant materials are present on the geotextile, it shall be cleaned or replaced as directed by the Engineer.

3.1.2.4 No equipment used will damage the geotextiles by handling, trafficking or other means. Equipment, including ATVs, will not be allowed to travel directly on the geotextiles during the installation of overlying soils or geosynthetic layers unless otherwise determined by the Engineer.

3.1.3 Seaming or Joining:

3.1.3.1 Geotextiles:

3.1.3.1.1 Geotextiles shall be seamed using either an eighteen inch overlap, sewing or heat laminating/welding. The specific conditions requiring a sewn seam or simply an overlap are as follows:

a. In all cases, seams on side slopes will be parallel to the line of slope and sewn 5 feet from the toe-of-slope upward over the length of the slope and into the anchor trench. No horizontal seams will be allowed on side slopes, except for patching.

b. Geotextiles placed on the subgrade, or between two soil layers at less than 10 percent slope may utilize an 18-inch overlap seam.

c. Where the slope is greater than 10 percent, or directly above a geomembrane, these seams shall be sewn as stated above.

3.1.3.1.2 Sewing will be done using a polymeric thread with chemical compatibility resistance equal to or exceeding the geotextile being sewn. Thread and the sewing device shall be approved by the Engineer prior to its use in the field.

3.1.3.1.3 Repair of tears or holes in the geotextile will require the following procedures:

a. On slopes: A patch made from the same geotextile will be double seamed into place; with each seam 1/4-inch to 3/4-inch apart and no closer than 1-inch from any edge. Should any tear exceed 10% of the width of the roll, that roll will be removed from the slope and replaced.

b. Flat slopes: A patch made from the same geotextile will be spot-seamed in place with a minimum of 24-inch overlap in all directions.

3.2 POST-CONSTRUCTION:

3.2.1 Upon completion of the installation, the Contractor shall submit to the Engineer:

a. All quality control documentation.

b. The warranty obtained from the Manufacturer/Fabricator.

SECTION 02072

GEOTEXTILE

3.3 WARRANTY:

3.3.1 The Contractor shall obtain and submit to the Owner from the manufacturer a standard warranty provided for the geotextiles. The warranty shall guarantee that the geotextile shall remain free from defects for a minimum of one (1) year from the date of substantial completion of the project. The Engineer will review the warranty for completeness prior to the Owner accepting its provisions.

PART 4 - MEASUREMENT & PAYMENT

4.1 DESCRIPTION:

4.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to perform installation of Geotextiles, as shown on the Contract Drawings, as specified, or as ordered by the Engineer.

4.2 PAYMENT - WORK INCLUDED:

4.2.1 Work under this item shall generally be comprised of but not limited to:

- Furnishing and installing all geotextile material.
- All sewing and ties associated with installation of the geotextile.
- Laboratory and field testing required.
- Subgrade preparation and maintenance.
- Fabrication around all structures, vaults, inlets, manholes, gas vents, monitoring wells and recovery wells.
- As-built drawings (updated weekly).

SECTION 02072

GEOTEXTILE

4.3 RELATED WORK NOT INCLUDED:

4.3.1 The following items of work closely related to geotextile are specifically not included under this item:

- LLDPE Lining Material
- PVC Lining Material
- Common Fill
- Select Fill Type A
- Select Fill Type C
- Select Fill Type D

4.4 BASIS FOR PAYMENT:

4.4.1 The quantity of Geotextile for which payment will be made will be the plan view area in square feet covered by the Geotextile. This area shall be determined based on as-built drawings of the Geotextile provided by the Contractor and accepted by the Engineer.

No payment will be made under this item for overlaps, splices, repairs, anchors or geotextile not shown on the Contract Drawings, specified, or ordered by the Engineer.

No payment will be made under this item for work performed by the Contractor to replace defective work, or for which work is not shown on the Contract Drawings, specified, or ordered by the Engineer.

END OF SECTION

SPECIFICATIONS

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;

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- 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.

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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.

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.

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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.

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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.

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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.

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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:

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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".

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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.

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.

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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.I 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.

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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

SPECIFICATIONS

SECTION 02222

GRANULAR FILL

PART 1 - GENERAL

1.1 DESCRIPTION:

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

PART 2 - PRODUCTS

2.1 GRANULAR FILL:

2.1.1 The Granular Fill shall consist of clean, durable, gravel or stone, well graded from coarse to fine, conforming to New York State Department of Transportation Standard Specifications Item 304.03 (Subbase Course Type 2).

2.1.1.1 Granular Fill material shall be provided for roadway construction and piping embedment.

2.1.2 The Contractor shall submit to the Engineer a certified sieve analysis by an independent testing laboratory showing that the materials meet the required gradation, at no cost to the Owner.

PART 3 - EXECUTION

3.1 PLACING:

3.1.1 In general, the Granular Fill shall be spread in horizontal layers so that the maximum thickness of any layer after compaction shall not exceed six (6) inches. Compaction shall be by travelling vibrators or other approved method and shall be to a minimum dry density of ninety-five percent (90%) of the maximum dry density as determined by the Modified Proctor Test, ASTM D1557. Each layer shall be thoroughly compacted before placement of overlying layers.

SECTION 02222

GRANULAR FILL

3.1.2 For pipe embedment, place initial backfill in 6-inch maximum loose lifts to one foot above pipe unless otherwise specified. Ensure that initially placed material is tamped firmly under pipe haunches. Place additional material in 9-inch maximum loose lifts unless otherwise specified. Compact each loose lift as specified in 3.1.1.

3.2 COMPACTION TEST:

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

3.2.2 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 for each fifty (50) cubic yards of material placed and/or as shown or specified in the drawings.

3.2.3 The Contractor shall provide one optimum moisture-maximum density curve for each type of soil encountered in subgrade and fills under the mat, building slabs and grade beams as directed by the Engineer.

3.2.4 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 soil encountered and fills under slabs.

3.2.5 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.

SECTION 02222

GRANULAR FILL

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - GRANULAR FILL:

4.1.1 The quantity of Granular Fill 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 - GRANULAR FILL:

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

END OF SECTION

SPECIFICATIONS

SECTION 02226

SELECT FILL MATERIALS

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.1.2 Work under this Section shall include furnishing, transport, dumping and placement of Select Fill Materials in the areas and to the depths and grades shown on the engineering drawings and/or directed by the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 Select fill materials shall be of the types listed below:

Type (A) - Select Fill
Type (B) - Select Fill
Type (D) - Select Fill

2.1.1.1 Type (A) - Select fill shall consist of clean, sound, medium to coarse sand, less than 3/8 inch in the maximum dimension, free from organic material and coatings, and possessing a minimum permeability of 1.0×10^{-3} cm/sec at a relative density of 90 percent. In addition, this material must have less than ten percent, by weight, pass the No. 200 sieve.

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SELECT FILL MATERIALS

2.1.1.2 Type (B) - Select fill shall consist of clean, screened, durable, sharp-angled fragments of crushed gravel of uniform quality, conforming to New York State Department of Transportation #3/4 Stone, with the gradation shown below:

% Passing By Weight	Sieve
100	2"
90 - 100	1-1/2"
0 - 15	1"
0 - 3	#200

In addition, this material must be free of organic material and coatings, and possess a minimum permeability of 1.0×10^{-1} cm/sec at a relative density of 90 percent.

2.1.1.2.1 A crushed particle shall be defined as one in which the total area of face fracture exceeds 25 percent of the maximum cross-sectional area of the particle. When two fractured faces are designated, the total area of each fractured face shall exceed 25 percent of the maximum cross-sectional area of the particle.

2.1.1.2.2 A naturally fractured face shall be acceptable providing that the sharp angular portion of the particle consists of sound material and is free from unsound or injurious coatings.

2.1.1.3 Type (D) - Select fill shall consist of clean, washed, sound, fine gravel, conforming to New York State Department of Transportation #2 Stone, with the gradation shown below:

% Passing By Weight	Sieve
100	1-1/2"
90 - 100	1"
0 - 15	1/2"
0 - 3	#200

SECTION 02226

SELECT FILL MATERIALS

2.1.2 Special Considerations:

2.1.2.1 Material to be utilized for Type D select fill shall have a calcium carbonate content of less than 30% as determined by ASTM D3042.

2.1.3 Submittals:

2.1.3.1 The Contractor shall submit to the Engineer for approval a certified sieve analysis for each type of select fill material, the minimum permeability for Type A and Type D select fills, calcium carbonate content for Type D select fill, and the minimum and maximum relative densities for each type of select fill as determined by an independent testing laboratory at no cost to the Owner. All tests will be performed in accordance with the methods outlined in this Section.

PART 3 - EXECUTION

3.1 USAGE:

3.1.1 Type (A) - Select fill material will be used to construct the soil drainage layer above the 40 mil geomembrane, or as directed by the Engineer.

3.1.2 Type (B) - Select fill material will be used as shown on the drawings, or as directed by the Engineer.

3.1.3 Type (D) - Select fill material will be used to construct the gas vent backfill, or as directed by the Engineer.

3.2 PLACEMENT:

3.2.1 Select fill materials shall be installed in accordance with Specification Section 02220, "Excavation", except as modified herein.

SECTION 02226

SELECT FILL MATERIALS

3.2.2 For all Select Fill Materials, the following preparation and inspection shall be conducted prior to placement:

a. Insure all placement procedures do not damage any underlying soil or geosynthetic layers. Equipment must access on approved temporary haul roads.

b. Verify stockpiled material to be used is approved for the particular layer.

c. Verify areas to be filled are properly compacted and all geosynthetics are in place.

d. Verify areas to be backfilled are free of debris, snow, ice or water and ground surfaces are not frozen.

e. Identify required lines, levels, contours and datums.

f. Proof roll existing subgrade as directed by the Engineer.

g. Multiple cover spreading points will not be allowed. One initial spreading location shall be established, and the work shall proceed from this location towards a free end of the geomembrane. Select fill material must be placed using vertical placement techniques. No horizontal pushing of the initial soil lift above the geomembrane will be allowed.

h. The landfill capping system must be constructed utilizing practices which will minimize the potential for slope failures. Gradual starting and stopping of all construction equipment will help reduce any dynamic loading which could cause a failure during the construction process.

SECTION 02226

SELECT FILL MATERIALS

3.2.3 For Types (A) and (B) select fill material, the following specific placement procedures shall be followed:

a. Place select fill to contours and elevations shown on Contract Drawings. Use unfrozen materials.

b. Spread systematically, with low ground pressure equipment which exerts a ground pressure of no more than 7 pounds per square inch in a manner that will minimize movement of the underlying geotextile and geomembrane materials and potential for puncture of geotextile and geomembranes.

c. Spread select fill in loose lifts up to 12 inches thick and compact using the weight of the dozer and/or a smooth drum roller to a minimum relative density of 50 percent. Hand tamp or vibrate as required in areas not accessible to heavy compaction equipment.

d. Where heavy compaction equipment cannot access, hand tamp or vibrate select fill in 6-inch lifts, and/or as directed by the Engineer.

e. Refer to Section 02595 and 02598 for placement of select fill over geomembranes.

3.2.4 For Type D select fill material, the following specific placement procedures shall be followed:

a. Place select fill to contours and elevations shown on Contract Drawings.

b. Hand tamp or vibrate in 6-inch lifts and/or as directed by the Engineer.

3.3 FIELD TESTING AND QUALITY CONTROL:

3.3.1 In-place density will be visually approved by the Engineer for the select fill materials with field density tests performed as requested by the Engineer at the Contractor's expense.

SECTION 02226

SELECT FILL MATERIALS

3.3.2 In addition to field density testing, the following laboratory testing will be performed at the Contractor's expense by an independent testing laboratory on samples of the select fill material. All samples of the select fill materials will be taken from in-place material.

a. One grain size (ASTM D422) analysis every 1,000 cubic yards of in-place material, or as directed by the Engineer.

b. One laboratory permeability test in accordance with ASTM D2434 per every 2,500 cubic yards of in-place Type A and D select fill, or as directed by the Engineer.

c. One minimum/maximum relative density test in accordance with ASTM D4253 and ASTM D4254 for every 5,000 cubic yards of in-place Type A and B select fill and one for each stockpile of Type D select fill to be pre-qualified.

3.4 CRITERIA AND TOLERANCES:

3.4.1 Criteria and tolerances of the select fill material are as listed in Paragraph 2.1.

3.5 REMEDIATION OF FAILED TEST RESULTS:

3.5.1 If laboratory test results indicate that the in-place material fails to meet the required specifications, additional samples shall be taken in the field and tested in order to isolate the unacceptable area. Once the limits of unacceptable material have been defined, the Contractor shall remove the unacceptable material, replace it and retest the new material, at no additional cost to the Owner.

3.5.2 If unacceptable material is in the initial lift directly above a geomembrane, the unacceptable material will be removed to within 4 inches of the geomembrane and replaced. Testing of the final layer will be performed on a sample representative of the actual completed lift.

SECTION 02226

SELECT FILL MATERIALS

PART 4 - MEASUREMENT & PAYMENT

4.1 DESCRIPTION

4.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to install selected fill, as shown on the Contract Drawings, as specified, or as ordered by the Engineer.

4.2 WORK INCLUDED:

4.2.1 Work under this Item shall generally be comprised of but not limited to:

- Furnishing, placing, spreading and compacting Select Fill materials shown on the Contract Drawings, specified or as ordered by the Engineer, which are not covered under other Items.
- Providing all tests as required in the Specifications.
- Providing all survey control, cross-sections and information specified in the Basis of Payment.

4.3 RELATED WORK NOT INCLUDED:

4.3.1 The following items of work closely related to select fill are specifically not included under this Item:

- Topsoil and Seed
- Common Fill

4.4 BASIS OF PAYMENT:

4.4.1 The quantity of Select Fill for which payment will be made will be the actual number of cubic yards of each type installed, as ordered by the Engineer, and will be computed based on volumes compacted in place in accordance with the Contract Drawings.

No payment will be made under this Item for Select Fill not ordered by the Engineer or in excess of the limits established. No payment will be made for Select Fill shown or specified to be included in other Payment Items.

END OF SECTION

SPECIFICATIONS

SECTION 02257

COMMON FILL

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.1.2 Work under this Section shall include, but not necessarily be limited to excavating, transporting, dumping, spreading and compacting common fill material in the locations and to the depths and grades shown on the Contract Drawings or as directed by the Engineer.

1.1.3 Common Fill will be used to construct the barrier protection layer of the landfill capping system.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 Common Fill Material shall be natural soil, free from excessive moisture, frost, stumps, trees, roots, sod, muck, marl, vegetable matter or other unsuitable materials.

2.1.2 Common Fill Material used to construct the barrier protection layer shall consist of on-site or off-site material as shown on the Contract Drawings. Acceptable material shall be well graded from fine to coarse with a minimum of 25 percent passing by weight the No. 200 sieve possessing a maximum permeability of 1×10^{-7} cm/sec. Stones, if any, shall not exceed six (6) inches in the greatest dimension.

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COMMON FILL

2.2 SUBMITTALS:

2.2.1 The Contractor shall submit to the Engineer for approval the following tests for each source of common fill material at no cost to the Owner:

- Grain Size Analysis (ASTM D422 and 2217)
- Atterberg Limits (ASTM D4318)
- Modified Proctor Compaction Test (ASTM D1557)
- Laboratory Permeability (ASTM D5084)

PART 3 - EXECUTION

3.1 PLACEMENT:

3.1.1 The entire surface to be covered with common fill shall be stripped of all grass, vegetation, top soil, rubbish, or other unsuitable materials before backfilling.

3.1.2 In general, common fill shall be placed in horizontal layers not exceeding eight (8) inches in loose thickness and shall be compacted according to the criteria and tolerances of Paragraph 3.3 unless otherwise noted in this Section. Stones, if any, shall not exceed six (6) inches in greatest dimension and shall be well distributed throughout the mass. Subgrade for common fill shall be approved by the Engineer. Where common fill is to be constructed across ground which will not support the weight of the construction equipment, the fill shall be constructed by placing 16 oz/yd^2 nonwoven geotextile on the subgrade or the soft soils excavated and replaced with suitable backfill as approved by the Engineer.

3.1.3 For berm construction, common fill shall be placed in horizontal layers not exceeding eight (8) inches in loose thickness. For barrier protection layer construction, the material shall be placed in one twelve (12) inch lift.

3.1.4 Each layer of common fill material shall be thoroughly tamped or rolled to the required degree of compaction by sheepsfoot, mechanical tampers, or vibrators. Successive layers shall not be placed until the layer under construction has been thoroughly compacted.

3.1.5 Sheepsfoot rollers shall be used wherever possible to compact common fill soil and shall have a weight on each row of feet of not less than two hundred (200) nor more than five hundred (500) pounds per square inch of foot surface.

SECTION 02257

COMMON FILL

3.1.6 Trucks or other heavy equipment shall not be operated over pipelines until a minimum of twenty-four (24) inches of backfill above the crown of the trenched pipe has been placed and properly compacted by tampers or other approved method.

3.1.7 Where required, the Contractor shall, at his own expense, moisture condition the fill to meet the compaction requirements of the specification. If, due to rain or other causes, the material is too wet for satisfactory compaction, it shall be allowed to dry or be removed as required, before compaction.

3.2 FIELD TESTING AND QUALITY CONTROL:

3.2.1 Common fill shall be compacted to a minimum dry density of ninety (90) percent of the maximum dry weight density in pounds per cubic foot as determined by the Modified Proctor Compaction Test, ASTM D1557 unless otherwise noted on the Contract Drawings or Specifications. Modified Proctor, Grain Size Analyses (ASTM D422 and 2217) and Atterberg Limits (ASTM D4318) shall be performed for each 5,000 cubic yard of fill placed by an independent testing laboratory at the Contractor's expense.

3.2.2 In-place density testing according to ASTM D2922, D2167 or D1556 procedures will be conducted at the frequencies given below:

- in-place testing will be performed at a frequency of one per 10,000 square feet per lift of common fill.

3.2.3 All in-place density tests will be located according to an approved testing grid system. Elevations will be established from known existing benchmarks by Contractor. Contractor shall establish the grid system in the field such that work areas can be easily located by the Engineer.

3.3 CRITERIA AND TOLERANCES:

3.3.1 Criteria and tolerances of common fill are as follows:

- Compaction - a minimum of 90 percent (or greater as determined by permeability testing) of the maximum dry density as determined by the Modified Proctor Method unless otherwise specified or directed.

SECTION 02257

COMMON FILL

PART 4 - MEASUREMENT & PAYMENT

4.1 DESCRIPTION:

4.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to install common fill, as shown on the Contract Drawings, as specified, or as ordered by the Engineer.

4.2 WORK INCLUDED:

4.2.1 Work under this Item shall generally be comprised of but not limited to:

- Placement and compaction to obtain grades in accordance with the Contract Documents as shown on the Contract Drawings.
- Obtaining necessary mining and hauling permits and nay additional related permits which may be required.
- Placement and compaction of common fill material in the excavations outside the limits of the cap where soil, debris and waste relocation activities were performed as shown on the Contract Drawings.
- Preparing subgrade onto which common fill is to be placed including fine grading and compaction per the Contract Documents.
- Placement and compaction of material around the edge of the landfill cap system to allow for tie-ins to existing grades, in accordance with the Contract Documents.
- Performing required laboratory and field testing.
- Providing all survey control, cross-sections and information specified in Basis of Payment.

4.3 RELATED WORK NOT INCLUDED:

4.3.1 The following items of work closely related to Common Fill are specifically not included under this Item:

- Select Fill Type A
- Select Fill Type B
- Select Fill Type D
- Topsoil and Seed

SECTION 02257

COMMON FILL

4.4 BASIS OF PAYMENT:

4.4.1 The quantity of embankment for which payment will be made will be the actual number of cubic yards of material furnished and placed as shown on the Contract Drawings, specified, or ordered by the Engineer. Measurement for payment shall be based on cross sectional measurements taken before and after placement of embankment material. The Contractor shall provide necessary surveys for determining the volumes for payment. The survey data shall be presented in hard copy of the plan view area being billed along with plotted cross sections with volume determinations shown. In addition, the survey data shall be presented on diskettes showing the raw data and the data suitably reduced to permit manipulation. Computation of the quantity of embankment material shall be based on cross-section measurements at maximum intervals of fifty feet or less, as directed by the Engineer, with volumes computed by the "average end areas" method or the "grid" method. Other methods of computing volume may be used if deemed acceptable by the Engineer.

No payment will be made under this Item for Embankment not shown on the Contract Drawings, specified, or ordered by the Engineer. Embankment shown or specified to be included in other Payment Items will not be paid for under this Item.

END OF SECTION

SPECIFICATIONS

SECTION 02271

RIPRAP

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.1.2 The Contractor shall furnish all plant, labor, equipment and materials and perform all work necessary to place a protective covering of erosion-resistant Riprap at locations shown on the Plans and as directed by the Engineer. The work shall be done in accordance with these specifications and in conformity with the lines and grades shown on the Plans or established by the Engineer. The type of Riprap to be used shall be as indicated on the Contract Drawings.

PART 2 - PRODUCTS

2.1 RIPRAP:

2.1.1 Stone used for Riprap shall be hard, durable, angular in shape, resistant to weathering and to water action, free from overburden, spoil, shale and organic material, and shall meet the gradation requirements for the type specified. Neither breadth nor thickness of a single stone should be less than one-third its length. Rounded stone or boulders will not be accepted unless authorized by the Engineer. Broken concrete may be substituted for stone when authorized by the Engineer. Shale and stone with shale seams are not acceptable. The minimum unit weight of the stone shall be 155 pounds per cubic foot as computed by multiplying the specific gravity (bulk-saturated-surface-dry basis, AASHTO Test T85) times 62.4 pounds per cubic foot.

2.1.2 The sources from which the stone will be obtained shall be selected for approval by the Engineer well in advance of the time when the stone will be required in the work. The acceptability of the stone will be determined by service records and/or by suitable tests, as required by the Engineer. If testing is required, suitable samples of stone shall be taken in the presence of the Engineer at least 25 days in advance of the time when the placing of Riprap is expected to begin. The approval of some rock fragments from a particular quarry site shall not be construed as constituting the approval of all rock fragments taken from that quarry.

SECTION 02271

RIPRAP

2.1.3 The quality of all material used for Riprap shall be determined by the Magnesium Sulfate Soundness Test, if so elected by the Engineer. A maximum 10 percent loss at ten (10) cycles, by weight, shall be acceptable.

2.1.4 The types of Riprap to be provided shall conform to the following gradation requirements:

Type	% Passing	Stone Size
I	90-100	Smaller than 8 inches
	50-100	Larger than 3 inches
	0-10	No. 10
II	90-100	Lighter than 100 lbs.
	50-100	Larger than 6 inches
	0-10	Smaller than 1/2 inch
III	50-100	Heavier than 100 lbs.
	0-10	Smaller than 4 inches
IV	50-100	Heavier than 600 lbs.
	0-10	Smaller than 6 inches

2.1.5 Each load of Riprap shall be reasonably well graded from the smallest to the maximum size specified. Stones smaller than the specified 10 percent size and spalls will not be permitted in an amount exceeding 10 percent by weight of each load.

2.1.6 Control of gradation will be by visual inspection. If requested by the Engineer, the Contractor shall provide two samples of rock of at least 5 tons each, meeting the gradation for the type specified. The sample at the construction site may be a part of the finished Riprap covering. The other sample shall be provided at the quarry. These samples shall be used as a frequent reference for judging the gradation of the Riprap supplied. Any difference of opinion between the Engineer and the Contractor shall be resolved by dumping and checking the gradation of two random truck loads of stone. Mechanical equipment, a sorting site, and labor needed to assist in checking gradation shall be provided by the Contractor at no additional cost to the Owner.

SECTION 02271

RIPRAP

2.1.7 In addition to meeting the gradation requirements set forth in this section for the type of Riprap indicated, Riprap shall consist of stones shaped as nearly as practicable in the form of right rectangular prisms. One dimension of the majority of the stones furnished shall be at least equal to the thickness as shown on the Plans.

2.2 BEDDING:

2.2.1 Bedding material shall be provided below the Riprap if indicated on the Plans or directed by the Engineer. Bedding material shall be composed of crushed stone, crushed air cooled blast furnace slag, or gravel, free of soft nondurable particles, organic material, and thin or elongated particles.

2.2.2 Bedding material shall meet the following gradation requirements:

Sieve Designation	% Passing
4 inches	100
1 inch	15-60
1/4 inch	0-25
No. 40	0-10

PART 3 - EXECUTION

3.1 PLACEMENT:

3.1.1 Slopes to be protected by Riprap shall be free of brush, topsoil, trees, stumps, and other objectionable material and shall be dressed to a smooth surface. All soft or spongy material shall be removed to the depth shown on the Plans or as directed by the Engineer and replaced with approved material. Filled areas will be compacted as specified. If shown on the Plans, a toe trench shall be dug and maintained until the Riprap is placed.

SECTION 02271

RIPRAP

3.1.2 Protection for structure foundations shall be provided as early as the foundation construction permits. The area to be protected shall be cleaned of waste materials and the surfaces to be protected prepared as shown on the Plans. The type of Riprap specified will be placed in accordance with these Specifications.

3.1.3 When shown on the Plans, a bedding material blanket shall be placed on the prepared slope or area to be provided with Riprap as specified in Paragraph 3.2.1 before the stone is placed.

3.1.4 Stone for Riprap shall be placed on the prepared slope or area in a manner which will produce a reasonably well-graded mass of stone with the minimum practicable percentage of voids. The entire mass of stone shall be placed so as to be in conformance with the lines, grades, and thicknesses shown on the Plans. Riprap shall be placed to its full course thickness in one operation and in such a manner as to avoid displacing the underlying material. Placing of Riprap in layers, or by dumping into chutes, or by similar methods likely to cause segregation will not be permitted.

3.1.5 The larger stones shall be well distributed, and the entire mass of stone shall conform to the gradation specified in Paragraph 2.1.4. All material going into Riprap protection shall be so placed and distributed that there will be no large accumulations of either the larger or smaller sizes of stone.

3.1.6 It is the intent of these Specifications to produce a fairly compact Riprap protection in which all sizes of material are placed in their proper proportions. Hand placing or rearranging of individual stones by mechanical equipment may be required to the extent necessary to secure the results specified.

3.1.7 Unless otherwise authorized by the Engineer, the Riprap protection shall be placed in continuous progression with the construction of the embankment. The Contractor shall maintain the Riprap protection until accepted, and any material displaced by any cause shall be replaced to the lines and grades shown on the Plans at no additional cost to the Owner.

3.1.8 When Riprap and bedding material are placed under water, thickness of the layers shall be increased as shown on the Plans; and methods shall be used that will minimize segregation.

SECTION 02271

RIPRAP

3.1.9 Riprap shall be placed so that the dimension approximately equal to the layer thickness is perpendicular to the slope surface and that the weight of the stone is carried by the underlying material and not by the adjacent stones. On slopes, the largest stones shall be placed at the bottom of the slope. The Riprap shall be properly aligned and placed so as to minimize void spaces between adjacent stones. The spaces between the stones shall be filled with spalls of suitable size.

3.2 BEDDING MATERIAL:

3.2.1 Bedding material shall be placed where shown on the Plans or as directed by the Engineer. The bedding material shall be placed on the prepared area to the full specified thickness of each layer in one operation, using methods which will not cause segregation of particle sizes. Contamination of bedding material by natural soils or other materials shall be prevented at all times. Bedding material that becomes contaminated shall be removed and replaced with uncontaminated bedding material at the Contractor's own expense. Filter fabric shall be placed below the bedding material, if shown on the Plans.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - RIPRAP:

4.1.1 The quantity of Riprap and bedding material to be paid for, of specified thickness and extent, in place and accepted, shall be the number of cubic yards as computed from surface measurements parallel to the Riprap surface and thickness measured normal to the Riprap surface.

4.2 PAYMENT - RIPRAP:

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

END OF SECTION

SPECIFICATIONS

SECTION 02435

PVC PLASTIC PIPE AND FITTINGS

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all referenced materials for PVC Plastic Pipe And Fittings to be used as gas vents, as shown on the Plans, as specified, and/or directed.

1.1.2 Material in this Section shall be used in the construction of the landfill gas vents.

1.2 SUBMITTALS:

1.2.1 The Contractor shall submit six (6) copies of the Manufacturer's material Specifications for each item to be supplied under this Section.

PART 2 - PRODUCTS

2.1 PVC PLASTIC PIPE AND FITTINGS: All PVC pipe and fittings shall be Schedule 40.

2.1.1 PVC material for the pipe and fittings shall meet the requirements of ASTM D1784 for Rigid Poly (Vinyl Chloride) Compounds and Chlorinated Poly (Vinyl Chloride) Compounds, Class 12454-B, or Class 12454-C.

2.1.2 The PVC pipe and fittings shall be extruded or molded in such a manner that all cross sections shall be dense, homogeneous, and free from porosity or other imperfections. The molded or extruded pipe and fittings shall conform to ASTM D1785 for Polyvinyl Chloride (PVC) Plastic Pipe and ASTM D2467 for Polyvinyl Chloride (PVC) Plastic Pipe Fittings.

2.1.3 Standard length of all pipe shall be 10 or 20 feet. Provide one coupling for each length of pipe provided. All pipe and fittings shall be of the solvent weld type unless otherwise indicated. Provide adequate solvent cement for the number of couplings and fittings provided.

SECTION 02435

PVC PLASTIC PIPE AND FITTINGS

2.1.3.1 The solvent cement shall be a solution of unplasticized PVC, tetrahydrofuran and cyclohexanone. The solvent cement shall meet the requirements of ASTM D2564 for Solvent Cements for Schedule 40 PVC plastic pipe and fittings. The solvent cement shall be heavy-bodied, grey cement specifically designated for use with Schedule 40 PVC pipe and humid weather. Primer shall be purple primer meeting the requirements of ASTM F656 for Primers/Cleaners for PVC piping systems.

2.1.4 Where perforated pipe is specified, perforations shall be 5/8-inch diameter holes on 5-inch centers, in four rows, 90 degrees apart. Slotted PVC pipe can be substituted for perforated pipe. When slotted is specified, slot shall be 2-inch typ., 0.020 slot.

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE:

3.1.1 All pipe, fittings, and specials will be inspected on delivery, and materials that do not comply with the Specification will be rejected. The Contractor shall furnish all labor required to handle the pipe and related materials during inspection and shall remove the rejected materials from the site of work.

3.2 INSTALLATION:

3.2.1 Installation of all pipe, fittings, specials, adapters and appurtenances shall conform to the manufacturer's recommendations and the following summary of installation recommendations. Where Specifications and recommendations conflict, the strictest shall apply.

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

3.2.3 Pipe shall be installed to the lines and grades on a prepared special embedment or support system, as shown, specified, or directed.

3.2.4 The interior surface of all pipe shall be clean when installed, and shall be kept clean until final acceptance.

SECTION 02435

PVC PLASTIC PIPE AND FITTINGS

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - PVC PLASTIC PIPE AND FITTINGS:

4.1.1 Measurement of the quantity of PVC Plastic Pipe and Fittings, allowed for payment shall be the actual linear feet of pipe installed and the number of each type of fitting installed.

4.2 PAYMENT - PVC PLASTIC PIPE AND FITTINGS:

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

END OF SECTION

SPECIFICATIONS

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 In the event the topsoil removed from areas of the Site is unsatisfactory, or the quantity available is inadequate, the Contractor shall furnish topsoil from an approved source or sources off the Site. The off-site material shall contain no admixture of refuse or any material toxic to plant growth and shall be free from subsoil, stumps, roots, brush, 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.

1. Where topsoil pH is below 5.0, lime shall be added at a rate of 2-1/2 lbs. per cubic yard of topsoil to raise the pH value one full point.

SECTION 02484

TOPSOIL

2. 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 to lower the pH value one full point.

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. If a noticeable change in topsoil quality is identified by the Engineer, the Contractor shall perform additional pH and organic content tests of the new material at no additional cost to the Owner.

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.

SECTION 02484

TOPSOIL

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 licensed surveyor hired by the Contractor.

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

SPECIFICATIONS

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 as shown on the Plans, as specified, and/or directed.

1.1.2 The Contractor shall seed new areas and disturbed areas where shown on the Drawings, specified or directed by the Engineer. Contractor shall prepare the seed bed by scarifying or otherwise loosening soil to a depth of 2 inches, applying fertilizer, lime, seed and mulch at the rates specified.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 Fertilizer:

2.1.1.1 Commercial fertilizer (19-19-19) shall contain not less than nineteen percent nitrogen, nineteen percent available phosphoric acid and nineteen percent water soluble potash. The fertilizer shall be inorganic or a combination of inorganic and organic substances.

2.1.1.2 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 19-19-19.

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

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

SECTION 02485

SEEDING

2.1.2 Seed:

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

2.1.2.2 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.

2.1.2.3 The following seed mixture shall be used for ditches, slopes and all areas disturbed by construction.

Percentage by Weight	Species or Variety	Percent Germination
30	Kentucky 31 Tall Fescue	85%
30	Perennial Ryegrass	85%
20	New Zealand White Clover	85%
20	Creeping Red Fescue	85%

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

2.1.2.5 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 shall not exceed one percent by weight for the mixture.

2.1.2.6 All seed mixtures furnished under this Item 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.

2.1.2.7 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

2.1.3 Mulch:

2.1.3.1 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.

2.1.4 Erosion Control Blankets:

2.1.4.1 The erosion control blanket shall be a machine-produced mat of agricultural straw and coconut fiber. The blanket shall be of consistent thickness with the material evenly distributed over the entire area of the mat. The blanket shall be sewn together on 1.5-inch centers with degradable thread.

2.1.4.2 The erosion control blankets shall be SC150 as manufactured by North American Green, or equivalent. The erosion control blanket shall have the following material content:

Straw	-	70% (.35 lb/sy)
Coconut Fiber	-	30% (.15 lb/sy)
Netting	-	Bottom lightweight photodegradable (1.64 lb/1,000 sf) Top heavyweight photodegradable with UV Additives (3 lb/1,000 s.f.)
Thread	-	Degradable

2.1.4.3 All erosion control blankets shall be properly stored by the Contractor at the site per manufacturer's recommendations. Any blankets damaged during storage shall be replaced at the Contractor's expense.

SECTION 02485

SEEDING

PART 3 - EXECUTION

3.1 INSTALLATION:

3.1.1 Time For Seeding:

3.1.1.1 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.

3.1.2 Preparation of Seed Bed:

3.1.2.1 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 free from depressions which will hold water. All sticks, stones, clods, roots or other objectionable material which might interfere with the formation of a fine seed bed shall be removed from the soil.

3.1.2.2 Commercial fertilizer shall be evenly applied at the rate of 600 pounds per acre.

3.1.3 Seeding:

3.1.3.1 Grass seed mixture shall be sown at the rate of 200 pounds per acre.

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

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

3.1.4 Mulching:

3.1.4.1 Within three days after the seed is sown, the seeded areas shall be covered with a uniform blanket of straw mulch or hay at the rate of 1,000 pounds per acre of seeded area or as required to provide 90% coverage (i.e., lightly cover 90% of the surface).

SECTION 02485

SEEDING

3.1.5 Hydroseeding:

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

3.1.5.2 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.

a.	Fertilizer	- 1000 lbs. per acre
b.	Seed	- 250 lbs. per acre
c.	Mulch	- Sufficient to equal 90% straw mulch coverage
d.	Mulch Anchorage	- Per Manufacturer's instructions
	Chemical	750 lbs. wood fiber/acre
	Wood Cellulose	

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

3.1.5.4 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.

3.1.6 Erosion Control Blanket Installation:

3.1.6.1 The erosion control blankets shall be installed as indicated on the Contract Drawings and/or directed. Conventional straw mulch (Article 3.1.4.1) shall not be installed where erosion control blankets are to be placed. Erosion control blankets can be installed directly over hydroseeded areas.

3.1.6.2 At the top of the slope, the blanket shall be anchored in a 6-inch deep x 6-inch wide trench. Backfilling and compaction of the trench shall be performed shortly after stapling the blanket in the trench.

SECTION 02485

SEEDING

3.1.6.3 Blankets shall be installed either down or horizontally across the slope. Edges of parallel blankets must be stapled with a minimum 3-inch overlap. When blankets are spliced down the slope, shingle the blankets with a minimum 6-inch overlap.

3.1.6.4 Staples shall be 6-inch wire staples, or approved equal. Staples shall be applied at a minimum of 1 staple per square yard on the blankets and a maximum of 12 inches apart on all overlap areas and in anchor trenches.

3.2 MAINTENANCE AND PROTECTION:

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

3.2.2 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.

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

3.2.4 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 for which payment will be made shall be the actual number of square feet covered in the horizontal plan view. This area shall be determined based on as-built drawings of the seeded area supplied by a licensed surveyor hired by the Contractor.

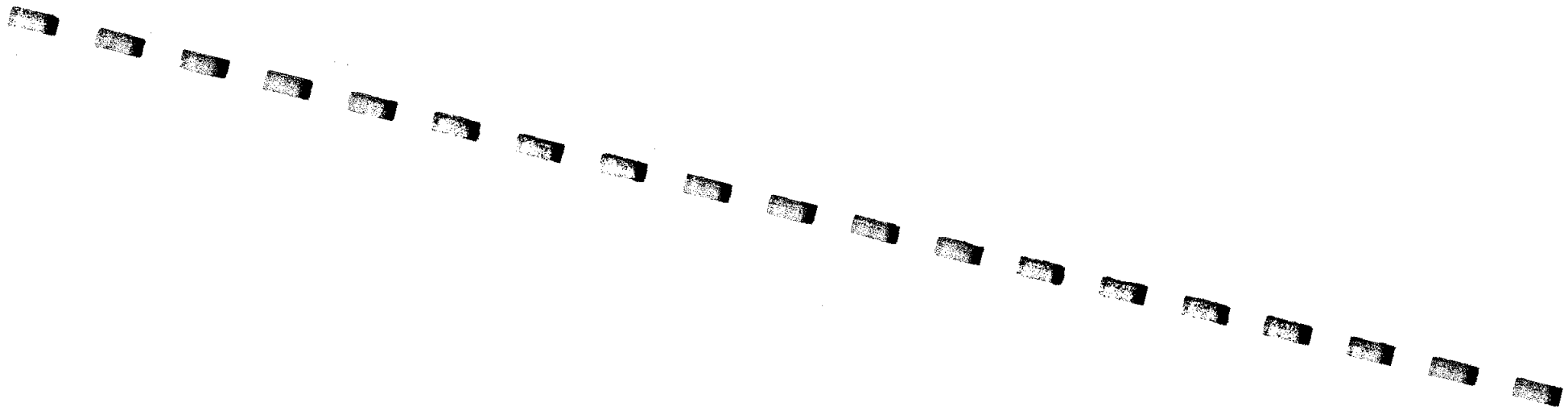
SECTION 02485

SEEDING

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.

END OF SECTION



SPECIFICATIONS

SECTION 02595

POLYVINYL CHLORIDE (PVC) LINING MATERIAL

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Polyvinyl Chloride (PVC) Lining Material as shown on the Plans, as specified, and/or directed.

1.1.2 The Contractor shall furnish and install 40 mil Polyvinyl Chloride (PVC) Lining Material as landfill cap geomembrane or as otherwise shown on the Contract Drawings.

1.2 SHEET QUALITY:

1.2.1 The Contractor shall submit to the Engineer the following information regarding sheet quality and properties.

1.2.1.1 A material properties sheet including, at a minimum, all specified properties, measured using test methods indicated in the Specifications, or equivalent.

1.2.1.2 A list and description of materials other than the base polymer which comprise the geomembrane.

1.2.1.3 A written certification that property values given in the properties sheet are guaranteed by the Geomembrane Manufacturer.

1.2.1.4 Certification that the sheeting shall contain no deep gas checks, surface divots, blisters, pinholes, windows and shall not exhibit cold flow. In addition, it shall be uniform in color, size and thickness.

SECTION 02595

POLYVINYL CHLORIDE (PVC) LINING MATERIAL

1.3 ROLL QUALITY:

1.3.1 Quality Control Certification:

1.3.1.1 Prior to shipment, the Contractor will provide the Engineer with a quality control certificate for each roll of geomembrane provided. The quality control certificate will be signed by a responsible party employed by the Geomembrane Manufacturer, such as the Production Manager. The Quality Control Certificate will include:

a. Roll numbers and identification.

b. Documentation certifying the geomembrane was continuously inspected for uniformity, damage, imperfections, holes, cracks, thin spots and foreign materials.

c. Sampling results of quality control tests; as a minimum, results will be given for thickness, tensile strength, tear resistance and seam strength evaluated in accordance with the methods indicated in the specifications or equivalent methods approved by the Engineer.

d. Documentation certifying non-destructive seam testing was performed on all fabricated seams over their full length using a test method acceptable to the Engineer.

e. Documentation certifying that the geomembrane has a hydraulic conductivity less than $1x10^{-12}$ centimeters per second.

1.4 DELIVERY, HANDLING AND STORAGE:

1.4.1 The Contractor will be liable for all damages to the materials incurred prior to and during transportation to the site.

1.4.2 Handling, storage and care of the geomembrane materials prior to and following installation at the site, is the responsibility of the Contractor.

SECTION 02595

POLYVINYL CHLORIDE (PVC) LINING MATERIAL

1.5 CONFORMANCE TESTING:

1.5.1 Upon delivery of the geomembrane, the Contractor shall provide the necessary labor, tools and equipment to obtain samples to be sent to the quality assurance laboratory for testing at the Contractor's expense to ensure conformance to both the design specifications and the list of guaranteed properties.

1.5.2 As a minimum, tests to determine the following characteristics will be performed on geomembranes:

a. specific gravity, ASTM D792A
b. thickness, ASTM D5199
c. tensile properties, ASTM D882
d. volatility loss, ASTM D1203A

1.5.3 Unless otherwise specified, samples will be 1.5 feet long by 20 feet of the panel width. The Engineer will mark the machine direction on the samples with an arrow.

1.5.4 Unless otherwise specified, geomembrane samples will be taken at a maximum rate of one per 100,000 square feet.

1.6 PRE-QUALIFICATIONS:

1.6.1 Geomembrane Manufacturer:

1.6.1.1 The Contractor shall submit to the Owner and the Engineer for approval the following qualification information regarding the Geomembrane Manufacturer:

a. Corporate background and information.

b. Manufacturing capabilities including:

- daily production quantity available for this Contract
- quality control procedures for manufacturing
- list of material properties including certified test results, to which geomembrane samples are attached.

c. A list of at least ten completed facilities, totaling a minimum of 10,000,000 square feet, for which the Manufacturer has manufactured a geomembrane of the type specified. For each facility, the following information will be provided:

- name and purpose of facility, its location and date of installation
- name of Owner, Project Manager, Designer, Fabricator (if any), and Installer
- thickness of geomembrane, surface area of geomembrane manufactured
- available information on the performance of the lining system and the facility.

d. Origin (resin supplier's name, resin production plan) and identification (brand name, number) of the resin.

1.6.2 Geomembrane Fabricator (if required):

1.6.2.1 The Contractor shall submit to the Engineer for approval the following written information in regards to the Geomembrane Fabricator (if required).

a. Copy of Geomembrane Manufacturer's letter of approval of license.

b. Corporate background and information.

c. Fabrication Capabilities:

- daily fabrication quantity available for this Contract
- quality control procedure
- samples of fabricated seams and a certified list of minimum values of seam properties and employed test methods.

d. A list of at least ten completed facilities for which the Fabricator has fabricated liner factory panels of the type of geomembrane to be used in this project, totaling a minimum of 10,000,000 square feet, the following information will be provided for each fabrication:

- name and purpose of facility, its location, and date of installation
- name of Owner, Project Manager, Designer, Manufacturer, Installer, and the name of the contact at the site who can discuss the project

- thickness of liner and surface area of liner fabricated
- type of seaming and type of seaming apparatus used
- available information on the performance of the lining system and the facility.

1.6.3 Installer:

1.6.3.1 The Installer must be trained and qualified to install geomembrane and must be approved and/or licensed by the Geomembrane Manufacturer and/or Fabricator.

1.6.3.2 The Contractor shall submit to the Engineer for approval the following written information, relative to the Installer.

a. Copy of Installer's letter of approval or license by the Manufacturer and/or Fabricator.

b. Corporate background and information.

c. Description of installation capabilities, including:

- information on equipment and personnel
- average daily production anticipated
- quality control procedures.

d. A list of at least ten completed facilities, totaling a minimum of 3,000,000 square feet for which the Installer has installed geomembrane of the type for this project. For each installation, the following information will be provided:

- name and purpose of facility, its location and date of installation
- name of Owner, Designer, Manufacturer, Fabricator (if any), and name of contact at the facility who can discuss the project
- name and qualifications of the supervisor(s) of the Installer's crew(s)
- thickness of geomembrane and surface area of the installed liner
- type of seaming and type of seaming apparatus used
- duration of installation
- available information on the performance of the lining system and the facility.

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e. Resume of the "master seamer" to be assigned to this project, including dates and duration of employment.

f. Resume of the field engineer or installation supervisor to be assigned to this project, including dates and duration of employment.

1.6.3.3 All personnel performing seaming operations will be qualified by experience or by successfully passing seaming tests. The field crew foreman must have experience seaming a minimum of 50 acres of geomembrane of the type for this project, using the same type of seaming apparatus in use at the site.

1.7 SHOP DRAWING SUBMITTALS: The Contractor shall submit detailed shop drawings of all prefabricated PVC fabrications for review prior to installation. Shop drawings shall contain all necessary panel layouts, details, dimensions, etc., sufficient to assure that fabrication shall meet the intended use and will conform to the geometry of its intended application.

1.8 WARRANTY:

1.8.1 The Contractor shall obtain and submit to the Engineer from the Manufacturer and Installer separate written warranties guaranteeing for a 20 year and 2 year period (respectively) from the date of issuance of the Certificate of Substantial Completion that the liner materials and workmanship specifically provided or performed under this Contract shall be free from defects. Said warranty shall apply to normal use and service by the Owner as described in Contract Specifications and as shown on the Contract Drawings. It shall specifically exclude mechanical abuse or puncture by machinery, equipment, or people, exposure of the liner to harmful chemicals or catastrophe due to earthquake, flood or tornado. Such written warranty shall provide for the repair or replacement of the defect or defective area of lining materials upon written notification and demonstration by the Owner of the specific nonconformance of the lining material or installation with the project Specifications. Such defects or nonconformance shall be repaired or replaced within a reasonable period of time of such notification. The Owner agrees to pay an amount equal to the then current sales and installation price of the defective portion of the lining material multiplied by a fraction, the numerator of which shall be the number of years elapsed since the commencement of the warranty period and the denominator of which shall be the warranty period, provided that portion of the area in question has been made available to the Manufacturer/Installer and that such areas have been cleared of all liquids, sludges, earth, sand or gravel.

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PART 2 - PRODUCTS

2.1 RAW MATERIALS:

2.1.1 Prior to installation of any geomembrane material, the Contractor shall submit to the Engineer the following information regarding resin quality.

2.1.1.1 A copy of the Quality Control Certificates issued by the Resin supplier.

2.1.1.2 Reports on the tests conducted by the Manufacturer to verify the quality of the resin used to manufacture the geomembrane rolls assigned to the considered facility.

2.1.1.3 A statement of origin and identification of raw materials used.

2.1.1.4 Documentation demonstrating the chemical compatibility of the materials.

2.2 PVC GEOMEMBRANE MINIMUM SPECIFICATIONS:

2.2.1 PVC liner material shall have a matted finish on at least one side. Matted side of PVC panel to be installed on top.

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2.2.2 PVC liner material shall meet the minimum specification values listed below.

PROPERTY	SPECIFICATION LIMIT	TEST METHOD
Raw Material	(All domestic and Virgin Polyvinyl Chloride)	
Thickness (mils)	40 (± 5%)	ASTM D5199
Specific Gravity	1.23-1.30	ASTM D792
Cold Crack	Pass	ASTM D1790
Tensile Properties - Tensile Strength at Break (lb/in) - Modulus at 100% Elongation (lb/in) - Elongation (%) at Break	 90 min. 40 min. 300%	 ASTM D882 ASTM D882 ASTM D882
Tear Resistance (lbs/in)	10 min.	ASTM D1004
Water Extraction (%)	0.35 (max.)	ASTM D3080
Volatility (% Loss)	0.60 (max.)	ASTM D1203
Resistance to Soil Burial % change, max.: - Tensile Strength - Elongation at Break - Modulus at 100% Elongation	 ±5 ±20 ±20	ASTM D3083
Hydrostatic Resistance (psi)	175 min.	ASTM D751
Factory Seam Requirements* - Bonded Seam Strength (factory seam, breaking factor lbs/inch width)	 74	 ASTM D3083
*Factory bonded seam strength is the responsibility of the fabricator.		

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2.3 LABELING GEOMEMBRANE ROLLS OR PANELS:

2.3.1 Labels on each roll or factory panel will identify:

a. The thickness of the material
b. The length and width of the roll or factory panel
c. The Manufacturer
d. Directions to unroll the material
e. Product identification
f. Lot number
g. Roll or field panel number

PART 3 - EXECUTION

3.1 GEOMEMBRANE INSTALLATION:

3.1.1 Related Earthwork:

3.1.1.1 Geomembrane liners will be installed on a firm, smooth, soil surface. The final soil surface will be relatively free from stones, clumps, sticks or any other material that may puncture the membrane. Special care should be taken to maintain the prepared soil surface. No geomembrane will be placed onto an area which has become softened by precipitation. The Contractor shall certify in writing that the final soil surface on which the membranes are to be installed is acceptable.

3.2 GEOMEMBRANE DEPLOYMENT:

3.2.1 Placement of the geomembrane panels will be according to the approved location and position plan provided by the Installer. Placement will follow all instructions on the boxes or wrapping containing the geomembrane materials which describe the proper methods of unrolling, and/or unfolding rolls and panels. The field panel installation schedule is left to the preference of the Contractor, but the method chosen must minimize erosion of the underlying soil liner and the potential for wind damage.

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3.2.2 The method of placement must ensure that:

3.2.2.1 No equipment used will damage the geomembrane by handling, trafficking, leakage of hydrocarbons, or other means.

3.2.2.2 No personnel working on the geomembrane will smoke, wear damaging shoes, or engage in other activities which could damage the geomembrane.

3.2.2.3 The prepared surface underlying the geomembrane must not be allowed to deteriorate after acceptance and must remain acceptable up to the time of geomembrane placement.

3.2.2.4 Adequate temporary loading and/or anchoring (e.g., sand bags, tires), not likely to damage the geomembrane, will be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels).

3.2.2.5 Direct contact with the geomembrane will be minimized; i.e., the geomembrane in excessively high traffic areas will be protected by geotextiles, extra geomembrane, or other suitable materials.

3.2.3 Any damage to the geomembrane panels or portions of the panels as a result of placement must be replaced or repaired at no cost to the Owner. The decision to replace or repair any panel or portions of panels will be made by the Engineer.

3.2.4 The Engineer will assign an "identification number" to each geomembrane panel placed. This number will be consistent with the number used by the Installer. The number system used will be simple, logical and identify the relative location in the field.

3.3 SEAMING DURING INSTALLATION:

3.3.1 At liner penetrations and corners the number of seams will be minimized.

3.3.2 The area of the geomembrane to be seamed shall be cleaned and prepared according to the procedures specified by the material manufacturer. Care will be taken to eliminate or minimize the number of wrinkles and "fishmouths" resulting from seam orientation.

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3.3.3 Seaming will not proceed in extreme heat (above 105°F) or extreme cold (below 32°F) conditions. The specified temperature range is for ambient air. In addition, seaming will not be conducted when geomembrane material is wet from precipitation, dew, fog, etc., or during excessive wind.

3.3.4 Seams will have an overlap beyond the weld large enough to perform destructive peel tests, but not exceed 5 inches. Any material used to temporarily bond adjacent geomembrane panels must not damage or leave the geomembrane altered in any manner.

3.3.5 Trial seams will be made of excess geomembrane material. A 1-foot by 3-foot seamed liner sample will be fabricated with the seam running down the 3-foot length in the center of the sample. Such trial seaming will be conducted prior to the start of each seaming succession (i.e. at the start of each morning and afternoon session). From each trial seam, two sample field test specimens will be taken. The test specimens will be 1-inch by 12-inch strips cut perpendicular to the trial seam. Pass and fail criteria will be based on an approved curing chart submitted by the Contractor to the Engineer. Upon initial failure, a second trial seam will be made; if both test specimens do not pass, then the seaming method will be reviewed and seamer will not perform any seaming operations until the deficiencies are corrected and two successive passing trial seam test specimens are produced. Completed trial seam samples cannot be used as portions of a second sample and must be discarded.

3.3.6 The Contractor shall use a prefabricated PVC boot for all liner penetrations by pipes.

3.3.7 Acceptable seaming method for PVC is lap jointing with an approved cold applied solvent or hot wedge welding (single or double wedge). Lap joints shall be formed by lapping 6 inch minimum of the PVC material. Actual welded surface will be a minimum of 4 inches.

3.4 SEAM TESTING:

3.4.1 Nondestructive Testing:

3.4.1.1 The Contractor shall perform nondestructive seam testing on 100 percent of all field seams (including patches and boots). The Contractor shall test seams as directed in Paragraph 3.4.1.2 or 3.4.1.3.

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3.4.1.2 Air Channel Test: The air channel test shall be used on all seams constructed using a double hot wedge welder (except for double wedge seams welded transversely across factory fabricated panels). The following procedures will be followed:

a. Determine the area to be tested, and seal off two ends of the continuous air channel.

b. Insert an air pressure needle into the air channel by penetrating the upper geomembrane.

c. Connect a pressure gage to the needle.

d. Connect an air pump to the pressure gage. The air pump should be capable of generating and sustaining an air pressure of 50 psi.

e. Inflate the air channel to a pressure of 25 psi, and disconnect the air pump.

f. Sustain the inflated pressure for 2 minutes, and observe any pressure drop. If more than a 4 psi pressure loss occurs, the tested seam will be subject to repair.

3.4.1.3 Air Lance Testing: Air lance testing will be used on all seams not air-channel tested (including patches and boots). The procedure for this method is outlined below:

a. a testing device capable of producing a jet of air at approximately 50 psi through a 3/16-inch diameter orifice will be used as the lance
b. place the lance beneath the overlap
c. move the lance slowly along the solvent bond seam
d. observe the seam for localized fluttering or inflation
e. mark the seam for repair where fluttering or inflation occurs
f. testing is to be conducted under the direct observation of the Engineer

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3.4.2 Destructive Testing:

3.4.2.1 In addition to non-destructive seam testing, destructive testing will also be conducted. Test samples will be taken every 500 feet of seam length or more frequently at the discretion of the Engineer. Sample location and size will also be selected by the Engineer. The sample size (12x44 inches) will be large enough to produce three sets of test specimens for the following tests:

a. seam shear strength (ASTM D4437)
b. peel adhesion (ASTM D4437)

3.4.2.2 Ten specimens will compose a set. Half of these will be tested for peel and the other half for shear strength. Each specimen will be 1 inch wide and 12 inches long with the field seam at the center of the specimen. The 44-inch sample length will first be cut at the ends to produce two field peel test specimens. The remaining 42 inches will be divided into thirds and submitted to the Installer for laboratory testing, an independent testing laboratory and the Owner for storage and future reference. The independent laboratory testing shall be performed at the Contractor's expense.

3.4.2.3 Test specimens will be considered passing if the minimum values below are met or exceeded for four of the five test specimens tested by the independent laboratory. All acceptable seams will lie between two locations where samples have passed.

FIELD SEAM PROPERTIES	SPECIFICATION LIMIT PVC	TEST METHOD
Thickness (mils)	40	ASTM D5199
Shear Strength at Yield (lb/in width)	74 (80% of Roll Strength and FTB*)	ASTM D4437
Peel Adhesion	15 lbs/in width or FTB*	ASTM D4437
*FTB = Film tearing bond.		

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3.4.2.4 If a sample fails destructive testing, the Installer must ensure that: the seam is reconstructed between the location of the sample which failed and the location of the next acceptable sample; or the bonding path is retraced to an intermediate location at least ten feet from the location of the sample which failed the test, and a second sample is cut from the liner for additional testing. If this second test sample passes, the seam must be then reconstructed between the location of the second test and the original sampled location. If the second sample fails, the process must be repeated.

3.4.2.5 All holes created by the Installer cutting out destructive samples will be patched immediately with an oval patch of the same material bonded to the membrane using solvent-cement (PVC). The patch seams will be tested using an air lance and the procedures described above. Work will not proceed with materials covering the geomembrane until passing results of destructive testing have been achieved.

3.5 LINER REPAIR:

3.5.1 All imperfections, flaws, construction damage, destructive and nondestructive seam failures will be repaired by the Contractor at no additional expense to the Owner. The appropriate methods of repair are listed below:

a. patching, used to repair holes, tears, undispersed raw materials and contamination by foreign matter
b. capping, used to repair pinholes or other minor flaws
c. topping, used to repair areas of large length of failed seams or of inadequate seams, which have an exposed edge
d. removing bad seam and replacing with a strip of new material solvent welded into place.

3.5.2 The actual method used will be agreed upon by the Engineer, Installer and Contractor. All defects that are patched will have the patch overlap the edge of the defect by a minimum of 6 inches. The patch will be cut with rounded edges (no corners). In the case of a large patch, the underlying geomembrane will be cut appropriately to avoid trapping gases and moisture between the two sheets.

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3.5.3 During repair, the Engineer must be present and observe the procedures as well as all nondestructive testing of the repair seams. If the repair is very large, destructive testing may be required at the discretion of the Engineer. Any failure of repaired seams will require that the patch be removed, replaced and retested until passing results are achieved.

3.6 CONSTRUCTION MATERIAL PLACEMENT:

3.6.1 All granular materials placed above geomembrane shall be spread with a minimum initial lift thickness of 12 inches using tracked equipment with ground pressures not exceeding 7 pounds per square inch. No construction equipment will be driven directly on the geomembrane. All rubber-tired vehicles will access construction above geomembranes from temporary access roads built a minimum of 3 feet above the liner. Extra geotextile or geomembrane layers shall be placed on or beneath all access roads or high trafficked areas. Any placement operation which results in damage to the underlying geomembrane, or in the opinion of the Engineer, has the potential of damaging the underlying geomembrane, shall immediately cease and be modified to prevent such damage.

3.6.2 Placement of overlying cover soil shall be performed in a systematic manner in accordance with this Section and Section 02226. Cover soil must be placed using vertical placement techniques. No horizontal pushing of the initial soil lift above the geomembrane will be allowed.

3.7 POST-CONSTRUCTION:

3.7.1 The Installer of the geomembrane materials will prepare and the Contractor shall submit, to the Engineer, record drawings illustrating the following information:

a. dimensions of all geomembrane field panels
b. panel locations referenced to the Contract Drawing plans
c. identify all field seams and panels with the appropriate number or code
d. location of all patches, repairs and destructive testing samples
e. warranties

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PART 4 - MEASUREMENT & PAYMENT

4.1 DESCRIPTION:

4.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to perform installation of the Flexible Membrane (PVC) Cover as shown on the Contract Drawings, as specified, or as ordered by the Engineer.

4.2 WORK INCLUDED:

4.2.1 The work of this Item shall generally be comprised of but not limited to:

- Furnishing and installing Flexible Membrane (PVC) Cover.
- All fusion and extrusion welds and seams required to construct the PVC Flexible Membrane Cover.
- All fusion and extrusion welds required to seal around all structures, vaults, inlets and manholes located within the limits of the cap system.
- Furnishing and installing of all pipe boot for gas vents and monitoring wells.
- Laboratory and field testing required.
- Pre-approved subgrade preparation and maintenance.
- As-built drawings (updated weekly) showing panel/roll numbers, layout plan, seam location and identification, and the location of patches, destructive seam samples, and penetrations and anchorage details.
- Furnishing all slip sheets required for the installation of the PVC Flexible Membrane Cover.

4.3 RELATED WORK NOT INCLUDED:

4.3.1 The following Items of work closely related to PVC Flexible Membrane Cover are specifically not included under this Item:

- LLDPE Lining Material
- Common Fill
- Geotextile
- Select Fill Type A

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- Select Fill Type C
- Select Fill Type D

4.4 BASIS OF PAYMENT:

4.4.1 The quantity of PVC Lining Material for which payment will be made is the plan view area in square feet covered by the lining material. This area shall be determined based on as-built drawings provided by the Contractor and accepted by the Engineer.

No payment will be made under this Item for overlaps, splices, repairs, seams, anchorages or PVC Lining Material not shown on the Contract Drawings, specified, or ordered by the Engineer.

No payment will be made under this Item for work performed by the Contractor to replace defective work, or for which work is not shown on the Contract Drawings, specified, or ordered by the Engineer.

END OF SECTION

SPECIFICATIONS

SECTION 02598

LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Linear Low Density Polyethylene (LLDPE) Lining Material as shown on the Plans, as specified and/or directed.

1.1.2 The lining material will be used as the barrier layer of the capping system.

1.1.3 The lining material will be textured on both sides for all applications.

1.2 PRE-QUALIFICATIONS:

1.2.1 Geomembrane Manufacturer:

1.2.1.1 The Contractor shall submit to the Owner and the Engineer for approval the following qualification information regarding the Geomembrane Manufacturer:

a. Corporate background and information.

b. Manufacturing capabilities including:

- daily production quantity available for this Contract
- quality control procedures for manufacturing
- list of material properties including certified test results, to which geomembrane samples are attached.

c. A list of at least ten completed facilities, totaling a minimum of 10,000,000 square feet, for which the Manufacturer has manufactured a geomembrane. For each facility, the following information will be provided:

- name and purpose of facility, its location and date of installation
- name of Owner, Project Manager, Designer, Fabricator (if any), and Installer
- thickness of geomembrane, surface area of geomembrane manufactured
- available information on the performance of the lining system and the facility.

d. Origin (resin supplier's name, resin production plan) and identification (brand name, number) of the resin.

1.2.2 Geomembrane Fabricator (if required):

1.2.2.1 The Contractor shall submit to the Engineer for approval the following written information in regards to the Geomembrane Fabricator (if required).

a. Copy of Geomembrane Manufacturer's letter of approval of license.

b. Corporate background and information.

c. Fabrication Capabilities:

- daily fabrication quantity available for this Contract
- quality control procedure
- samples of fabricated seams and a certified list of minimum values of seam properties and employed test methods.

d. A list of at least ten completed facilities for which the Fabricator has fabricated liner factory panels of the type of geomembrane to be used in this project, totaling a minimum of 3,000,000 square feet, the following information will be provided for each fabrication:

- name and purpose of facility, its location, and date of installation
- name of Owner, Project Manager, Designer, Manufacturer, Installer, and the name of the contact at the site who can discuss the project
- thickness of liner and surface area of liner fabricated
- type of seaming and type of seaming apparatus used
- available information on the performance of the lining system and the facility.

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1.2.3 Installer:

1.2.3.1 The Installer must be trained and qualified to install geomembrane and must be approved and/or licensed by the Geomembrane Manufacturer and/or Fabricator.

1.2.3.2 The Contractor shall submit to the Engineer for approval the following written information, relative to the Installer.

a. Copy of Installer's letter of approval or license by the Manufacturer and/or Fabricator.

b. Corporate background and information.

c. Description of installation capabilities, including:

- information on equipment and personnel
- average daily production anticipated
- quality control procedures.

d. A list of at least ten completed facilities, totaling a minimum of 3,000,000 square feet for which the Installer has installed geomembrane of the type for this project. For each installation, the following information will be provided:

- name and purpose of facility, its location and date of installation
- name of Owner, Designer, Manufacturer, Fabricator (if any), and name of contact at the facility who can discuss the project
- name and qualifications of the supervisor(s) of the Installer's crew(s)
- thickness of geomembrane and surface area of the installed liner
- type of seaming and type of seaming apparatus used
- duration of installation
- available information on the performance of the lining system and the facility.

e. Resume of the "master seamer" to be assigned to this project, including dates and duration of employment.

f. Resume of the field engineer or installation supervisor to be assigned to this project, including dates and duration of employment.

1.2.3.3 All personnel performing seaming operations will be qualified by experience or by successfully passing seaming tests. At least one seamer will have experience seaming a minimum of 3,000,000 square feet of geomembrane of the type for this project, using the same type of seaming apparatus in use at the site.

1.2.4 Sheet Quality:

1.2.4.1 The Contractor shall submit to the Engineer the following information regarding sheet quality and properties.

a. A material properties sheet including, at a minimum, all specified properties, measured using test methods indicated in the specifications, or equivalent.

b. A list and description of materials other than the base polymer which comprise the geomembrane.

c. A written certification that property values given in the properties sheet are guaranteed by the Geomembrane Manufacturer.

1.2.5 Roll Quality:

1.2.5.1 Prior to shipment, the Contractor will provide the Engineer with a quality control certificate for each roll of geomembrane provided. The quality control certificate will be signed by a responsible party employed by the Geomembrane Manufacturer, such as the Production Manager. The Quality Control Certificate will include:

a. Roll numbers and identification.

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b. Documentation certifying the geomembrane was continuously inspected for uniformity, damage, imperfections, holes, cracks, thin spots, foreign materials, tears, punctures and blisters.

c. Sampling results of quality control tests; as a minimum, results will be given for thickness, tensile strength, tear resistance and seam strength evaluated in accordance with the methods indicated in the specifications or equivalent methods approved by the Engineer.

d. Documentation certifying non-destructive seam testing was performed on all fabricated seams over their full length using a test method acceptable to the Engineer.

1.2.6 Prior to delivery of material, the Contractor shall submit a sample of the warranty to be provided as described in paragraph 3.2.3.

1.3 DELIVERY, HANDLING AND STORAGE:

1.3.1 The Contractor will be liable for all damages to the materials incurred prior to and during transportation to the site.

1.3.2 Handling, storage and care of the geosynthetic materials prior to and following installation at the site, is the responsibility of the Contractor. The Contractor will be liable for all damages to the materials incurred prior to final acceptance of the lining system by the Owner.

1.3.3 The Contractor shall notify the Owner of the anticipated delivery time.

1.4 CONFORMANCE TESTING:

1.4.1 Within one week of delivery of the geomembrane, and at the Engineer's direction, the Contractor shall provide the necessary labor, tools and equipment to obtain samples of the geomembrane at the specified frequency for forwarding to the approved testing laboratory for testing at the Contractor's expense to ensure conformance to both the design specifications and the list of guaranteed properties.

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1.4.2 As a minimum, tests to determine the following characteristics will be performed on geomembranes:

a. density, ASTM D792/D1505

b. carbon black content, ASTM D1603

c. carbon black dispersion, ASTM D3015

d. thickness, ASTM D1593

e. tensile properties, ASTM D638

1.4.3 Geomembrane samples will be taken across the entire width of the roll. Unless otherwise specified, samples will be 2.0 feet long by the roll width. The Engineer will mark the machine direction on the samples with an arrow.

1.4.4 Unless otherwise specified, geomembrane samples will be taken at a maximum rate of one per 100,000 square feet.

1.4.5 For each lot number of geomembrane material that arrives at the site, a sample shall be taken by the Contractor and provided to the Owner for archiving. This sample shall be 3.0 feet long by the width of the roll.

1.4.6 Any samples which fail the conformance testing will require the failed material to be removed from site and replaced with new material at the Contractor's expense.

1.5 WARRANTY:

1.5.1 The Contractor shall submit a draft copy of the warranty to be provided upon completion of the project. The warranty shall meet the requirements of Article 3.2.3 of this Specification.

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1.6 ADDITIONAL SUBMITTALS:

1.6.1 The Contractor shall submit detailed shop drawings. Shop drawings shall contain all necessary panel layouts, details, dimensions, penetration fabrications, etc., sufficient to assure that fabrication shall meet the intended use and will conform to the geometry of its intended application.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 Raw Materials:

2.1.1.1 Prior to installation of any geomembrane material, the Contractor shall submit to the Engineer the following information regarding resin quality.

a. A copy of the Quality Control Certificates issued by the Resin supplier.

b. Reports on the tests conducted by the Manufacturer to verify the quality of the resin used to manufacture the geomembrane rolls assigned to the considered facility. These tests should include for resins, specific gravity (ASTM D792 Method A), melt flow index (ASTM D1238 Condition E), percent carbon black (ASTM D1603) and percent carbon dispersion (ASTM D3015).

c. A statement of origin and identification of raw materials used.

d. Documentation demonstrating the chemical compatibility of the materials to withstand leachate generated by municipal solid waste.

2.1.2 LLDPE Geomembrane Minimum Specifications:

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LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

2.1.2.1 LLDPE liner material shall meet the minimum Specification values listed below.

LLDPE Geomembrane Resin:

Property	Specification Limit	Test Method
Specific Gravity (min.)	0.915	ASTM D1505
Melt Flow Index	0.1-1.1 g/10	ASTM D1238 Condition E
Carbon Black Content	2-3%	ASTM D1603
Carbon Dispersion	A1 or A2 Rating	ASTM D3015

LLDPE Geomembrane Rolls:

Property	Specification Limit	Test Method
Mechanical		
Thickness	40 mil	ASTM D1593
Specific Gravity (min.)	0.915	ASTM D1505
Tensile Properties		ASTM D638
Tensile Strength at Break (min.)	80 lbs./in.	
Tensile Strength at Yield (min.)	58 lbs./in.	

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Property	Specification Limit	Test Method
Elongation at Break (min.)	350%	
Elongation at Yield (min.)	13%	
Modulus of Elasticity (min.)	45,000 psi	ASTM D638
Tear Resistance (min.)	23 lbs.	ASTM D1004
Puncture Resistance (min.)	48 lbs.	FTMS 101C Method 2065
Environmental		
Water Vapor Transmission Rate	≤ 0.03 gm/m^2-day	ASTM E96
Low Temperature Brittleness (max.)	-70° C	ASTM D746
Water Absorption (max. % wt. change)	0.1%	ASTM D570
Volatile Loss (max.)	0.1%	ASTM D1203
Dimensional Stability (each direction, % change max.)	+/-1%	ASTM D1204

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LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

2.1.3 Labeling Geomembrane Rolls:

2.1.3.1 Labels on each roll or factory panel will identify:

- The thickness of the material.
- The length and width of the roll or factory panel.
- The Manufacturer.
- Directions to unroll the material.
- Product identification.
- Lot number.
- Roll or field panel number.

PART 3 - EXECUTION

3.1 GEOMEMBRANE INSTALLATION:

3.1.1 Related Earthwork:

3.1.1.1 The Contractor shall insure that all related earthwork requirements under this Section are complied with:

a. Geomembrane liners will be installed as shown on the construction drawings. The geomembrane installations will be performed on a firm, smooth, soil or geosynthetic constructed according with the Specifications. The final surface will be free from stones, clumps, sticks or any other material that may puncture the membrane. Installation of the geomembrane on loose or gravelly soils is prohibited.

b. No geomembrane will be placed onto an area which has become softened by precipitation or which has cracked due to desiccation. Appropriate methods of moisture control are the responsibility of the Contractor.

c. The Geomembrane Installer shall certify in writing that the final soil material or geosynthetic surface on which the membranes are to be installed are acceptable.

d. Free edges of LLDPE liner shall be secured in such a manner as to prevent uplift by wind or the intrusion of water under the liner. Edge protection shall include sandbags, polyethylene sheeting or other methods as deemed necessary by the Contractor and approved by the Engineer. Any damage to underlying soil material or geosynthetic shall be repaired at the Contractor's expense.

e. The LLDPE membrane will be temporarily anchored within an anchor trench constructed to the dimensions shown in the Contract Drawings. Care will be taken while backfilling the trenches to prevent damage to the geomembrane.

3.1.2 Geomembrane Deployment:

3.1.2.1 LLDPE membrane will be deployed according to the following procedures:

a. Placement of the geomembrane panels will be according to the approved location and position plan provided by the Installer. Placement will follow all instructions on the boxes or wrapping containing the geomembrane materials which describe the proper methods of unrolling panels. The field panel installation schedule is left to the preference of the Contractor, but the method chosen must minimize erosion of the underlying soil material and the potential for wind damage.

b. The method of placement must ensure that:

- Deployed geomembrane must be visually inspected for uniformity, tears, punctures, blisters or other damage or imperfections. Any such imperfections shall be immediately repaired and reinspected.

- No equipment used will damage the geomembrane by handling, trafficking, leakage of hydrocarbons, or other means. Equipment or ATVs, will not be allowed to travel directly on the geomembrane during the installation of overlying soils or geosynthetic layers unless otherwise determined by the Engineer.

- No personnel working on the geomembrane will smoke, wear damaging shoes, or engage in other activities which could damage the geomembrane.

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LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

- The prepared surface underlying the geomembrane must not be allowed to deteriorate after acceptance and must remain acceptable up to the time of geomembrane placement and until completion of the project.

- Adequate temporary loading and/or anchoring (e.g., sand bags, tires), not likely to damage the geomembrane, will be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels).

- Direct contact with the geomembrane will be minimized; i.e., the geomembrane in excessively high traffic areas will be protected by geotextiles, extra geomembrane, or other suitable materials.

c. Any damage to the geomembrane panels or portions of the panels as a result of placement must be replaced or repaired at no cost to the Owner. The decision to replace or repair any panel or portions of panels will be made by the Engineer.

d. The Engineer will assign an "identification number" to each geomembrane panel placed. This number will be consistent with the number used by the Installer. The number system used will be simple, logical and identify the relative location in the field.

e. When deploying a textured LLDPE geomembrane over a GCL or geocomposite, a temporary slip sheet will be used to minimize friction and to allow the textured geomembrane to be more easily moved into its final position. To prevent premature hydration, only the amount of GCL that can be inspected, repaired, and covered in the same day shall be installed.

SECTION 02598

LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

3.1.3 Seaming:

3.1.3.1 The seaming procedures below shall be implemented, where applicable, during installation of the geomembrane. The seaming procedures are as follows:

a. Generally, all seams whether field or factory will be orientated parallel to the line of slope, not across slope. This specification applies to all slopes in excess of 10 percent grade. All horizontal seams will be a minimum of 5 feet from the toe of the side slopes. At liner penetrations and corners the number of seams will be minimized.

b. The area of the geomembrane to be seamed shall be cleaned and prepared according to the procedures specified by the material manufacturer. Any abrading of the geomembrane will not extend more than one-half inch on either side of the weld. Care will be taken to eliminate or minimize the number of wrinkles and "fishmouths" resulting from seam orientation.

c. Field seaming is prohibited when either the air or sheet temperature is below 32°F or when the sheet temperature exceeds 158°F or when the air temperature is above 104°F. At air or sheet temperatures between 32°F and 40°F seaming shall be conducted directly behind a preheating device. In addition, seaming shall not be conducted when geomembrane material is wet from precipitation, dew, fog, etc., or when winds are in excess of 20 miles per hour.

d. Seaming shall not be performed on frozen or excessively wet underlying soil surfaces.

e. Seams will have an overlap beyond the weld large enough to perform destructive peel tests, but not exceed 5 inches. Any material used to temporarily bond adjacent geomembrane panels must not damage or leave the geomembrane altered in any manner.

f. The Contractor shall perform trial seams on excess geomembrane material. A 1 foot by 3 foot seamed liner sample will be fabricated with the seam running down the 3 foot length in the center of the sample. Such trial seaming will be conducted prior to the start of each seaming succession for each seaming crew, change in machine or every 4 hours, after any significant change in weather conditions or geomembrane temperature, or after any change in seaming equipment. From each trial seam, two

field test specimens will be taken. The test specimens will be 1-inch by 12-inch strips cut perpendicular to the trial seam. These specimens will be peel tested using a field tensiometer, and recorded as pass (failure of liner material) or fail (failure ofseam). Upon initial failure, a second trial seam will be made; if both test specimens do not pass, then the seaming device and its operator will not perform any seaming operations until the deficiencies are corrected and two successive passing trial seam test specimens are produced. Completed trial seam samples cannot be used as portions of a second sample and must be discarded.

g. Seams will be continuous through the anchor trench. No fishmouths shall be allowed within the seam area. Where fishmouths occur, the material shall be cut, overlapped and an overlap weld shall be applied. Where necessary, patching using the same liner material will be welded to the geomembrane sheet.

h. Where seams cannot be nondestructively tested in accordance with Section 3.1.4.1 of this Specification due to the geometry of the completed seams, a single layer of geomembrane shall be cap seamed over the subject seam and nondestructively tested if practical.

i. Acceptable seaming methods for LLDPE geomembrane are:

- extrusion welding using extrudate with identical physical, chemical and environment properties
- hot wedge welding using a proven fusion welder and master seamer.

j. Seaming device shall not have any sharp edges which might damage the geomembrane liner. Where self-propelled seaming devices are used, it will be necessary to prevent "bulldozing" of the device into the underlying soil or geosynthetic material.

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LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

3.1.4 Seam Testing:

3.1.4.1 The Contractor shall perform nondestructive seam testing on 100 percent of all field seams. The following test method and procedures may be used:

a. Vacuum testing will be used on all seams not tested using air pressure testing. Using an approved vacuum box, the following procedures will be followed:

- apply a soapy water mixture over the seam
- place vacuum box over soapy seam and form a tight seal
- create a vacuum by reducing the vacuum box pressure to 5 psi (35 KPa)
- observe through the vacuum box window any bubbles
- where bubbles are observed, mark seam for repair
- move vacuum box further down seam overlapping tested seam by 3 inches
- where hot wedge seaming has been performed, the overlap must be cut back to the weld
- all vacuum testing will be conducted under the direct observation of the Engineer.

b. Air pressure testing may be used in place of the vacuum box if double track hot wedge welding has been utilized to seam LLDPE geomembrane. Using approved pressure testing equipment, the following procedures will be followed:

- seal one end of the air channel separating the double hot wedge welds
- insert pressure needle into air channel at this end
- seal open end of channel, and pressurize the air channel to 25 psi
- monitor pressure gauge for 3 minutes and determine whether pressure is maintained without a loss of more than 3 psi.
- if the pressure test fails, then localize the leak and mark the area for repair
- air pressure testing will be conducted under the direct observation of the Engineer.

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3.1.4.2 In addition to nondestructive seam testing, the Contractor will perform destructive testing. The destructive testing procedures are as follows:

a. Test samples will be prepared by the Installer every 500 feet of seam length, a minimum of one test for each seaming machine per day, or more frequently at the discretion of the Engineer. Sample location and size will be selected by the Engineer. The sample size (12 x 56 inches) will be large enough to produce three sets of test specimens for the following tests:

   - Seam Shear Strength, ASTM D4437
   - Peel Adhesion, ASTM D4437

b. Ten specimens will compose a set. Half of these will be tested for peel and the other half for shear strength. Each specimen will be 1-inch wide and 12-inches long with the field seam at the center of the specimen. The 56-inch sample length will first be cut at the ends to produce two field peel test specimens. The remaining 54-inches will be divided into thirds and one-third submitted to the Contractor, one-third to the independent testing laboratory and one-third to the Engineer for storage and future reference.

c. Test specimens will be considered passing if the minimum values below are met or exceeded for four of the five test specimens tested by the independent laboratory. All acceptable seams will lie between two locations where samples have passed.

Field Seam Properties	Specification Limit LLDPE	Test Method
Shear Strength at Yield (lb/in width)	53	ASTM/D4437
Peel Strength (lb/in)	44 and Film Tear Bond	ASTM D4437

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3.1.4.3 If a sample fails destructive testing, the Contractor shall ensure that: the seam is reconstructed in each direction between the location of the sample which failed and the location of the next acceptable sample; or the welding path is retraced to an intermediate location at least ten feet in each direction from the location of the sample which failed the test, and a second sample is taken for an additional field test. If this second test sample passes, the seam must be then reconstructed between the location of the second test and the original sampled location. If the second sample fails, the process must be repeated.

3.1.4.4 If double track hot-wedge welding is used, the Engineer and the Installer must agree on the track weld that will be used in the destructive testing. The weld chosen inside or outside must be consistently tested and pass according to the criteria above.

3.1.4.5 All holes created by cutting out destructive samples will be patched by the Contractor immediately with an oval patch of the same material welded to the membrane using extrusion welding. The patch seams will be tested using a vacuum box and using the procedures described above. Work will not proceed with materials covering the geomembrane until passing results of destructive testing have been achieved.

3.1.5 Liner Repair:

3.1.5.1 All imperfections, flaws, construction damage, destructive and nondestructive seam failures will be repaired by the Installer. The appropriate methods of repair are listed below:

- patching, used to repair holes, tears, undispersed raw materials and contamination by foreign matter
- grinding and rewelding, used to repair small sections of extruded seams
- spot welding or seaming, used to repair pinholes or other minor, localized flaws
- capping, used to repair large lengths of failed seams
- topping, used to repair areas of inadequate seams, which have an exposed edge
- removing bad seam and replacing with a strip of new material welded into place (used with large lengths of fusion seams).

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3.1.5.2 The actual method used will be agreed upon by the Engineer, Installer and Contractor. All repair requiring abrading will be patched within one hour of the abrasion procedure. All defects that are patched will have the patch overlap the edge of the defect by a minimum of 6 inches. The patch will be cut with rounded edges (no corners). In the case of a large patch, the underlying geomembrane will be cut appropriately to avoid trapping gases and moisture between the two sheets.

3.1.5.3 During repair, the Engineer must be present and observe the procedures as well as all nondestructive testing of the repair seams. If the repair is very large, destructive testing may be required at the discretion of the Engineer. Any failure of repaired seams will require that the patch be removed, replaced and retested until passing results are achieved.

3.1.6 Construction Material Placement and Penetrations:

3.1.6.1 All granular materials placed above geomembrane shall be spread with a minimum initial lift thickness of 12 inches using tracked equipment with ground pressures not exceeding 7 pounds per square inch. No construction equipment will be driven directly on the geomembrane.

All rubber-tired vehicles will access construction above geomembranes from temporary access roads built a minimum of 3 feet above the liner. Extra geotextile or geomembrane layers shall be placed on or beneath all access roads or high trafficked areas. Any placement operation which results in damage to the underlying geomembrane, or in the opinion of the Engineer, has the potential of damaging the underlying geomembrane, shall immediately cease and be modified to prevent such damage.

3.1.6.2 Placement of overlying select fill or common fill shall be performed in a systematic manner in accordance with this Section and Section 02226 and/or Section 02257. Multiple cover spreading points will not be allowed. One initial spreading location shall be established, and the work shall proceed from this location towards a free end of the geomembrane where possible. Soil material must be placed using vertical placement techniques. No horizontal pushing of the initial soil lift above the geomembrane will be allowed.

3.1.6.3 To minimize the potential for slope failures, the initial soil lift above the geomembrane must be installed pushing up slope. Downslope lift placement is prohibited.

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LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

3.1.6.4 Wrinkles that develop from normal placement procedures must be controlled such that the underlying geomembrane does not fold over. Small wrinkles, defined as having their height less than or equal to one-half their base width, may be trapped and pushed down by the overlying soil. Any wrinkle which becomes too large and uncontrollable or which folds the geomembrane over must be brought to the attention of the Engineer. The Engineer will determine how to proceed, and his decision will be final. If necessary, the geomembrane will be uncovered, cut, laid flat, seamed by extrusion welding and non-destructively tested.

3.1.6.5 Cover system penetrations will be constructed for the landfill cap development. The configuration of these penetrations is detailed in the Contract Drawings. A prefabricated LLDPE boot shall be installed around each cover system penetration as shown. The penetration assembly shall be attached to each respective geomembrane liner by the extrusion weld process. Seams and materials used at these locations will be carefully constructed and inspected to insure proper construction has been achieved. Nondestructive testing will be performed on all seams where such testing is possible, otherwise refer to Paragraph 3.1.3.1(h).

3.2 POST-CONSTRUCTION:

3.2.1 The Installer of the geomembrane materials will prepare and the Contractor shall submit, to the Engineer, record drawings illustrating the following information:

- dimensions of all geomembrane field panels
- panel locations referenced to the Contract Drawing Plans
- identify all field seams and panels with the appropriate number or code
- location of all patches, repairs and destructive testing samples

3.2.2 Record drawing(s) will be submitted for each geomembrane layer constructed.

3.2.3 Warranty: The Contractor shall obtain and submit to the Engineer from the Manufacturer and Installer separate written warranties guaranteeing for a 20 year and 2 year period (respectively) from the date of issuance of the Certificate of Substantial Completion that the liner materials and workmanship specifically provided or performed under this Contract shall be free from defects. Said warranty shall apply to normal use and service by the Owner as described in Contract Specifications and as shown on the Contract Drawings. It shall specifically exclude mechanical abuse or puncture by machinery, equipment, or people, exposure of the liner to harmful chemicals or catastrophe due to earthquake, flood or tornado. Such written warranty

shall provide for the repair or replacement of the defect or defective area of lining materials upon written notification and demonstration by the Owner of the specific nonconformance of the lining material or installation with the project Specifications. Such defects or nonconformance shall be repaired or replaced within a reasonable period of time of such notification. The Owner agrees to pay an amount equal to the then current sales and installation price of the defective portion of the lining material multiplied by a fraction, the numerator of which shall be the number of years elapsed since the commencement of the warranty period and the denominator of which shall be the warranty period, provided that portion of the area in question has been made available to the Manufacturer/Installer and that such areas have been cleared of all liquids, sludges, earth, sand or gravel.

PART 4 - MEASUREMENT & PAYMENT

4.1 DESCRIPTION:

4.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to perform installation of the Flexible Membrane (LLDPE) Cover as shown on the Contract Drawings, as specified, or as ordered by the Engineer.

4.2 WORK INCLUDED:

4.2.1 The work of this Item shall generally be comprised of but not limited to:

- Furnishing and installing Flexible Membrane (LLDPE) Cover.
- All fusion and extrusion welds and seams required to construct the LLDPE Flexible Membrane Cover.
- All fusion and extrusion welds required to seal around all structures, vaults, inlets and manholes located within the limits of the cap system.
- Furnishing and installing of all pipe boot for gas vents and monitoring wells.
- Laboratory and field testing required.
- Pre-approved subgrade preparation and maintenance.

SECTION 02598

LINEAR LOW DENSITY POLYETHYLENE (LLDPE) LINING MATERIAL

- As-built drawings (updated weekly) showing panel/roll numbers, layout plan, seam location and identification, and the location of patches, destructive seam samples, and penetrations and anchorage details.
- Furnishing all slip sheets required for the installation of the LLDPE Flexible Membrane Cover.

4.3 RELATED WORK NOT INCLUDED:

4.3.1 The following Items of work closely related to LLDPE Flexible Membrane Cover are specifically not included under this Item:

- PVC Lining Material
- Common Fill
- Geotextile
- Select Fill Type A
- Select Fill Type B
- Select Fill Type D

4.4 BASIS OF PAYMENT:

4.4.1 The quantity of LLDPE Lining Material for which payment will be made is the plan view area in square feet covered by the lining material. This area shall be determined based on as-built drawings provided by the Contractor and accepted by the Engineer.

No payment will be made under this Item for overlaps, splices, repairs, seams, anchorages or LLDPE Lining Material not shown on the Contract Drawings, specified, or ordered by the Engineer.

No payment will be made under this Item for work performed by the Contractor to replace defective work, or for which work is not shown on the Contract Drawings, specified, or ordered by the Engineer.

END OF SECTION

SPECIFICATIONS

SECTION 02621

CORRUGATED POLYETHYLENE (CPE) DRAIN PIPE

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for corrugated polyethylene (CPE) drain pipe as shown on the Plans, as specified and/or directed.

1.1.2 The CPE drain pipe shall be used in the construction of the drainage layer terminations as shown on drawings or as ordered by the Engineer.

1.2 SUBMITTALS: The Contractor shall submit six (6) copies of the manufacturer's material specifications for each item to be supplied under this Section.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 The drainage pipe shall consist of corrugated polyethylene drainage piping as shown on drawings or as ordered by the Engineer.

2.1.2 The pipe shall exhibit a minimum stiffness as determined by AASHTO M252 of 35 psi at 5% deflection.

2.1.3 Perforated pipe shall exhibit a minimum of 4 square inches of open perforated area per foot of length.

PART 3 - EXECUTION

3.1 CONSTRUCTION:

3.1.1 The Contractor shall be responsible for the protection of the pipe against damage during transportation to the site, during storage at the site, and during installation. Only non-damaged pipe shall be included within the construction. Any damaged material, as determined by the Engineer, shall be replaced by the Contractor at no cost to the Owner.

SECTION 02621

CORRUGATED POLYETHYLENE (CPE) DRAIN PIPE

3.1.2 The pipe shall be laid to the lines and grades required or shown in the Construction Plans.

3.1.3 A split coupling shall be used where two pipe sections are to be coupled together.

3.1.4 The Contractor shall be responsible for keeping the interior of the pipe free of silt, soil or debris during construction.

3.1.5 All fittings, couplings, elbows, tees, etc., shall be of the same material as the pipe and manufactured by the same manufacturer.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - CORRUGATED POLYETHYLENE (CPE) DRAIN PIPE:

4.1.1 Measurement for which payment will be made for CPE Drain Pipe shall be the number of lineal feet of piping measured along the top of the pipe furnished and installed.

4.2 PAYMENT - CORRUGATED POLYETHYLENE (CPE) DRAIN PIPE:

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

4.2.2 The price bid shall include the cost of the 4-inch polyethylene pipe, excavation, and all materials, equipment and labor necessary to complete the work as shown or specified.

END OF SECTION

SPECIFICATIONS

SECTION 02641

SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE AND END SECTIONS

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Smooth Interior Corrugated Polyethylene Pipe and End Sections as shown on the Plans, as specified and/or directed.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 Smooth interior corrugated polyethylene pipe shall conform to the requirements of Section 706-12 of the New York State Standard Specifications latest edition. The units shall conform to the shape, dimensions and thickness shown on the Contract Drawings or as listed in the Additional Instructions.

2.1.2 Polyethylene end sections shall conform to the requirements of Section 706-12 of the New York State Standard Specifications, latest edition.

2.1.3 All smooth interior corrugated polyethylene pipe and end sections shall be of the same manufacturer and shall be designed to be joined by couplings or other positive mechanical means approved by the Engineer.

2.2 SUBMITTALS:

2.2.1 The Contractor shall submit six (6) copies of the manufacturer's material specifications for each item to be supplied under this Section.

SECTION 02641

SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE AND END SECTIONS

PART 3 - EXECUTION

3.1 CONSTRUCTION:

3.1.1 Smooth interior corrugated polyethylene pipe shall be installed in the locations shown on the Contract Drawings. Connections and embedment shall be performed in strict accordance with all manufacturer's recommendations and as indicated on the Drawings.

3.1.2 All pipe shall be laid in reasonably close conformity to line and grade and shall have a full firm and even bearing at each joint and along the entire length of pipe. Pipe laying shall begin at the downstream end and progress upstream. Any single run of pipe, including end sections, shall consist wholly of the same material unless otherwise directed by the Engineer.

3.1.3 All pipe shall be handled and assembled in accordance with the Manufacturer's instructions except as modified on the Plans or by the Engineer's written order.

3.1.4 Special care shall be exercised in placing and compacting material immediately adjacent to pipes in order to avoid damage to the pipe and to prevent pipe misalignment.

3.1.5 Movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be done at the Contractor's risk.

3.1.6 Corrugated polyethylene pipe connections for making field joints shall consist of corrugated bands, so constructed as to lap on equal portions of each culvert section to be connected. All connections shall be an approved type, fabricated and installed so that a secure and firm pipe connection may be readily made in the field.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE:

4.1.1 Measurement for which payment will be made for Smooth Interior Corrugated Polyethylene Pipe shall 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 drainage structures. For all structures, measurement will be to the outside face of the structure.

SECTION 02641

SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE AND END SECTIONS

4.2 PAYMENT - SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE:

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

4.2.2 The price bid shall include the cost of excavation, lining, special backfill, maintenance of traffic, topsoil and seeding, asphaltic concrete paving and saw cutting asphalt pavement or concrete pavement as required, and all materials, equipment and labor necessary to complete the work as shown and specified.

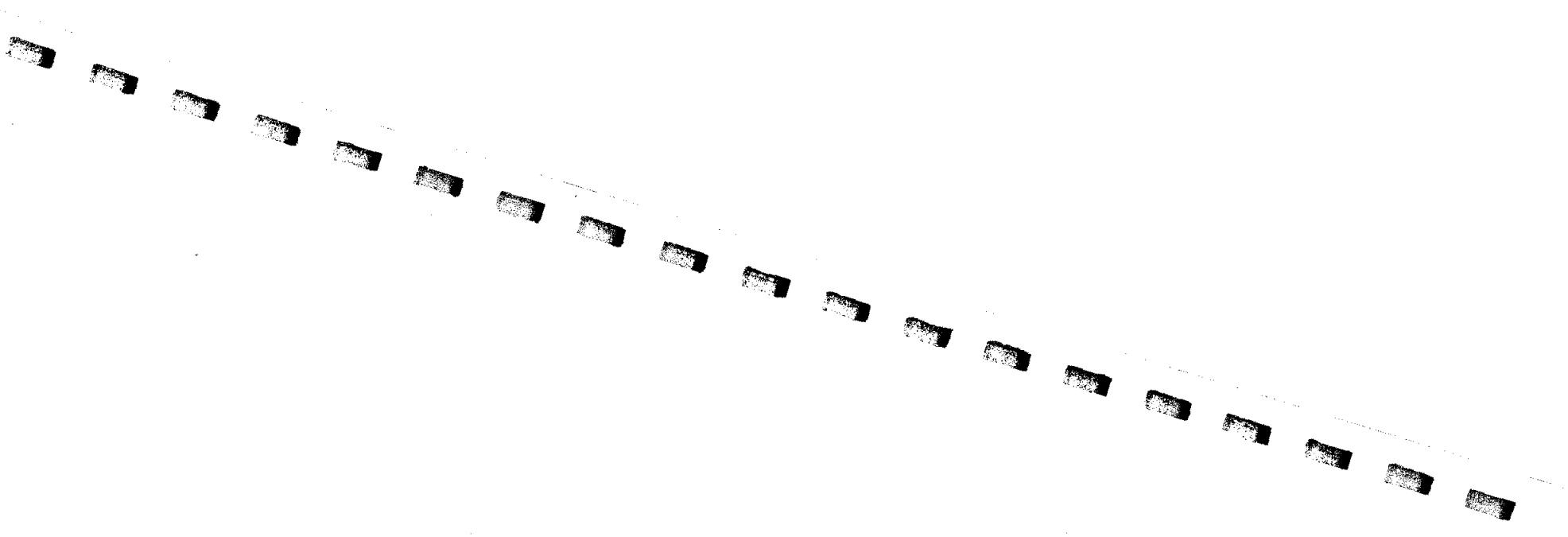
4.3 MEASUREMENT - END SECTIONS:

4.3.1 Measurement for which payment will be made for End Sections shall be the number of end sections incorporated in the work, in accordance with the Contract Drawings.

4.4 PAYMENT - END SECTIONS:

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

END OF SECTION



SPECIFICATIONS

SECTION 02677

ROTARY-DRILLED LANDFILL GAS VENT WELLS

PART 1 - GENERAL

1.1 DESCRIPTION: Under this Section, the Contractor shall furnish all labor, materials and equipment for Rotary-Drilled Landfill Gas Extraction Wells, as shown on the Plans, as specified, and/or directed. The installation of extraction wells will be approved in the field by the Engineer.

1.1.2 The work shall include but not be limited to the following:

- Excavation
- 6" Schedule 40 PVC gas vent pipe with removable gooseneck and bird screen
- Type D Select Fill, Section 02226, or approved material
- Installation as shown on Contract Drawings
- Pipe boot for geomembrane cap installations or bentonite backfill for soil barrier layer cap installation

1.2 REFERENCES: (Not Used)

1.3 SUBMITTALS:

1.3.1 The Contractor shall submit six (6) copies of the manufacturer's material Specifications for each item to be supplied under this Section.

1.3.2 The Contractor shall submit to the Engineer samples of all well backfill materials furnished.

1.3.3 The Contractor shall maintain detailed well logs and construction diagrams for all wells drilled, including the total depth of the well, the static water level (if present), depth, thickness, and description of soil or waste strata (including dates from any readable material, and the occurrence of any water bearing zones. Well logs shall be submitted to the Engineer.

1.4 DELIVERY, STORAGE, AND PROTECTION: Deliver materials in an undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact. Replace defective or damaged materials with new materials.

SECTION 02677

ROTARY-DRILLED LANDFILL GAS VENT WELLS

1.5 QUALITY ASSURANCE: All materials will be inspected on delivery, and materials that do not comply with the Specification will be rejected. The Contractor shall furnish all labor and equipment required to handle the materials and inspection, and shall remove the rejected materials from the site of work.

1.6 SITE CONDITIONS: Obstructions and saturated conditions are sometimes encountered when drilling in a landfill, many of which can be drilled through. The Contractor shall make reasonable efforts to drill through obstructions or saturated conditions, and will be paid for offset re-drilling or borehole abandonment only, if approved in writing by the Owner.

1.7 GENERAL REQUIREMENTS: Provide each extraction well complete and ready for operation. Each extraction well, including equipment, materials, installation, and workmanship shall be to the satisfaction of the Engineer.

PART 2 - PRODUCTS

2.1 EQUIPMENT: The Contractor shall utilize equipment mounted on a crawler chassis, an all-terrain vehicle chassis, or other low-ground pressure equipment approved by the Engineer during construction of all phases of well construction.

2.2 MATERIALS: Shall conform to the respective Specifications as referenced herein and as shown on the Plans.

2.2.1 Aggregate:

2.2.1.1 Gravel pack shall be Type D Select Fill, as specified in Section 02226, "Select Fill Materials".

2.2.2 Pipe: PVC, Schedule 80, as specified in Section 02435, "Polyvinyl Chloride (PVC) Pipe and Fittings".

2.2.2.1 Perforated/Slotted Pipe: Slots in PVC extraction well piping shall be 6-inch long by 1/4-inch wide, spaced 8 inches on vertical centers, spaced 90 degrees around circumference of pipe.

SECTION 02677

ROTARY-DRILLED LANDFILL GAS VENT WELLS

PART 3 - EXECUTION

3.1 DRILLING:

3.1.1 Extraction wells shall be 36-inch diameter, drilled to the depth shown on the drawings. Contractor shall use track-mounted dry drilling equipment; wet rotary drilling equipment may not be used.

3.1.2 The boring depths shown on the drawings are estimated and may be adjusted in the field by the Engineer. Two reasons limiting depth might be as follows:

a. If water is encountered in a boring, the Contractor shall drill beyond the point at which it was encountered. If wet conditions remain, the boring may be terminated and the length of perforated pipe adjusted by the Engineer, or the well may be relocated. If wet conditions cease (e.g., due to trapped water layer), then drilling will continue to the design depth.

b. Since base grades of this landfill are unknown, the depth of drilling may vary. When within 10 feet of estimated base grade, advance bucket with care noting drilling torque and pressure.

3.1.3 As soon as drilling is completed, a safety screen shall be placed over the top of the bore. This screen shall stay in place until backfilling is within 4 feet of the surface. Safety screen size shall be large enough to accommodate all backfill and materials, and any tools used during backfill yet not large enough for any person to accidently fall through.

3.2 PLACEMENT OF THE EXTRACTION WELL RISER: The Contractor shall supply and install the perforated and solid Schedule 80 PVC landfill gas riser, as specified in Section 02435, "Polyvinyl Chloride (PVC) Pipe and Fittings", as illustrated on the Plans.

3.2.1 The bore for the well shall be straight and the PVC well pipe as specified in Section 02435 shall be installed in the center of the borehole. The Contractor will take all tension off of the pipe by mechanical means and center the pipe in the middle of the borehole before starting to backfill. Pipe shall be slotted to within 3 foot of existing grade. Terminate solid pipe flush with existing grade and install temporary loose cap.

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ROTARY-DRILLED LANDFILL GAS VENT WELLS

3.3 PLACEMENT OF GRANULAR BACKFILL MATERIALS: The Contractor shall place Type B Select Fill materials, as specified in Section 02226, "Select Fill Materials", in the annular space between the borehole wall and the outside of the riser pipe, up to existing grade.

3.3.1 Backfilling of the well shall commence immediately after well drilling is completed and the well piping has been installed in the borehole. Backfill materials shall be installed as indicated on the drawings and as approved by the Engineer.

3.3.2 Gravel pack shall be poured or scooped through the screen at a rate that will not endanger the integrity of the well casing.

3.4 DISPOSITION OF EXCAVATED MATERIALS: The Contractor shall dispose of all waste excavated during construction of these wells on site as directed by the Engineer.

3.5 STANDBY TIME: The Contractor shall not charge the Owner nor the Engineer for standby time.

PART 4 - MEASUREMENT & PAYMENT

4.1 DESCRIPTION:

4.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to install Type A (AGV) Gas Vents, as shown on the Contract Drawings, specified, or ordered by the Engineer.

4.2 WORK INCLUDED:

4.2.1 Work under this Item shall generally be comprised of but is not limited to:

- Furnished and installing all Type A (AGV) Gas Vents as shown on the Contract Drawings and Specification.
- Furnishing and installing all materials associated with all Type A (AGV) Gas Vents in accordance with the Contract Drawings and Specifications.
- All excavation associated with installation of Type A (AGV) Gas Vents.

SECTION 02677

ROTARY-DRILLED LANDFILL GAS VENT WELLS

- All backfill operations associated with installation of the Gas Vents.
- Survey locations of all Type A (AGV) Gas Vents
- Furnishing and installing all Select Fill Material associated with the Type A (AGV) Gas Vents.
- On-site disposal of any spoil material from drilling activities.

4.3 RELATED WORK NOT INCLUDED:

4.3.1 The following Items of work closely related to Gas Vents are specifically not included under this Item:

- 13052 Landfill Gas Vents

4.4 BASIS FOR PAYMENT:

4.4.1 The quantity of Type A (AGV) Gas Vents for which payment will be made will be the actual lineal footage of Type A (AGV) Gas Vents, as measured from the coupling at subgrade to the bottom of the well pipe, as shown on the Contract Drawings Sheet G-8 File No. 331.032-09F or as ordered by the Engineer.

No payment will be made under this Item for work performed by the Contractor to replace (both places) defective work or for work which is shown in the Contract Drawings, specified, or ordered by the Engineer.

4.4.2 "For the above grade vent piping and appurtenances as shown on the drawings, payment will be made at the applicable unit price stated in the Bid.

END OF SECTION

SPECIFICATIONS

SECTION 02730

EXTERIOR SANITARY SEWER SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION:

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

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 basic designation only.

1.2.1 Federal Specification (Fed. Spec.):

RR-F-621D	Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole

1.2.2 American Concrete Pipe Association (ACPA) Publications:

Concrete Pipe Handbook, 1980

Concrete Pipe Installation Manual, 1984

1.2.3 American National Standards Institute (ANSI) Publications:

A14.3	Fixed Ladders, Safety Requirements
B16.1	Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250 and 800
B18.2.2	Square and Hex Nuts
B18.5	Round Head Bolts (Inch Series)

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EXTERIOR SANITARY SEWER SYSTEM

1.2.4 American Railway Engineering Association (AREA) Publication:

CH 1-5	Manual for Railway Engineering, (Fixed Properties)

1.2.5 American Society for Testing and Materials (ASTM) Publications:

A47	Ferritic Malleable Iron Castings
A48	Gray Iron Castings
A74	Cast Iron Soil Pipe and Fittings
A307	Carbon Steel Bolts and Studs, 60,000 psi Tensile
A536	Ductile Iron Castings
A563	Carbon and Alloy Steel Nuts
A746	Ductile Iron Gravity Sewer Pipe
C14	Concrete Sewer, Storm Drain, and Culvert Pipe
C76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C94	Ready-Mixed Concrete
C150	Cement, Portland
C361	Reinforced Concrete Low-Head Pressure Pipe
C443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets

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C478	Precast Reinforced Concrete Manhole Sections
C564	Rubber Gaskets for Cast Iron Soil Pipe and Fittings
C923	Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
C924	Testing Concrete Pipe Sewer Lines by Low Pressure Air Test Method
D2412	External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
D2680	Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping
D3033	Type PSP Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
D3034	Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
D3139	Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
D4101	Polypropylene Plastic and Injection Material
F402	Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings
F405	Corrugated Polyethylene (PE) Tubing and Fittings

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F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe (ANSI/ASTM F 477)

1.2.6 American Water Works Association (AWWA) Publications:

C104	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
C105	Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids
C110	Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids
C111	Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
C115	Flanged Ductile-Iron and Gray-Iron Pipe with Threaded Flanges
C151	Ductile-Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
C153	Ductile-Iron Compact Fittings, 3 in. through 12 in. (75 mm through 300 mm), for Water and Other Liquids
C302	Reinforced Concrete Water Pipe - Noncylinder Type, for Water and Other Liquids
C600	Installation of Ductile-Iron Water Mains and Appurtenances
C606	Grooved and Shouldered Type Joints

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C900	Polyvinyl Choride (PVC) Pressure Pipe, 4 in. through 12 in., for Water
M9	Concrete Pressure Pipe
M23	PVC Pipe - Design and Installation

1.2.7 Cast Iron Soil Pipe Institute (CISPI) Publications:

301	Hubless Cast-Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications
310	Patented Joint for Use in Connection with Hubless Cast-Iron Sanitary System

1.2.8 Uni-Bell Plastic Pipe Association (UNI) Publications:

B-3	Installation of Polyvinyl Chloride (PVC) Pressure Pipe
B-5	Installation of Polyvinyl Chloride (PVC) Sewer Pipe
B-6	Low-Pressure Air Testing of Installed Sewer Pipe

1.3 RELATED REQUIREMENTS: [Section [15011],"Mechanical General Requirements", applies to this Section with additions and modifications as specified herein.]

1.4 SYSTEM DESCRIPTION:

1.4.1 Sanitary Sewer Gravity Pipeline: Provide laterals sanitary piping 4-inch lines of XHCI. Provide building connections to existing sanitary and floor drain systems.

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EXTERIOR SANITARY SEWER SYSTEM

1.5 SUBMITTALS:

1.5.1 Shop Drawings: Submit for the following:

a. Concrete holding tank

1.5.2 Manufacturer's Data: Submit manufacturer's standard drawings or catalog cuts of the following items:

a. Pipe and fittings

b. Joints and couplings

c. Frames and covers for manholes

d. Cleanouts

e. Holding tank

1.5.3 Certificates of Compliance: Submit for the following:

a. Pipe and fittings, including factory-applied linings

b. Pipe joint materials

c. Cast iron frames, covers, and gratings

d. Holding tank calculations

Certificates shall attest that tests set forth in each applicable referenced publication have been performed, whether specified in that publication to be mandatory or otherwise. Production control tests shall have been performed at the intervals or frequency specified in the referenced publication. Other tests shall have been performed within 3 years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project.

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EXTERIOR SANITARY SEWER SYSTEM

1.6 DELIVERY, STORAGE, AND HANDLING:

1.6.1 Delivery and Storage:

1.6.1.1 Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

1.6.1.2 Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

1.6.1.3 Cement, Aggregate, and Reinforcement: As specified in Section 03302, "Cast-In-Place Concrete (Minor Construction)".

1.6.2 Handling: Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. Carry, do not drag, pipe to trench.

PART 2 - PRODUCTS

2.1 PIPELINE MATERIALS:

2.1.1 Cast-Iron Piping:

2.1.1.1 Cast-Iron Hub and Spigot Pipe and Fittings: ASTM A74, extra heavy, with ASTM C564 compression-type rubber gaskets.

2.1.1.2 Cast-Iron Hubless Pipe and Fittings: CISPI 301 with CISPI 310 coupling joints.

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EXTERIOR SANITARY SEWER SYSTEM

2.2 CONCRETE MATERIALS: Concrete materials shall be as specified in Section 03302, "Cast-In-Place Concrete (Minor Construction)".

2.3 MISCELLANEOUS MATERIALS:

2.3.1 Precast Concrete and Associated Materials:

2.3.1.1 Holding Tank: Provide capacity and type as indicated designed to withstand HS-20 load rating and buoyant forces resulting from groundwater at grade when empty. Septic tank shall be of precast construction with watertight joints provided with minimum 2-foot diameter access holes over the inlet and outlet.

2.3.1.2 Precast Concrete Pipe: Provide pipe of the diameters indicated, conforming to the New York State Department of Transportation Standard Specifications Item 603.74 (Reinforced Concrete Pipe Class II).

2.3.2 Metal Items:

2.3.2.1 Frames, Covers, and Gratings for Manholes: Fed. Spec. RR-F-621, cast iron; figure numbers shall be as indicated.

2.3.2.2 Holding Tank Piping: Cast iron soil pipe and fittings.

2.3.3 High Level Alarm System: Provide 120 volt NEMA 3R control panel constructed of 14 gauge cold rolled steel and finished in baked enamel. Panel shall include a "power on" pilot light an intrinsically safe type relay for connection to an intrinsically safe type high level control float. Alarm relay shall be activated by the intrinsically safe high level float, which in turn shall actuate a flashing alarm light mounted on the panel top. Alarm light shall remain on until the high level condition is corrected. Panel shall include condensation protection heater. Liquid-level float shall be displacement type, intrinsically safe, consisting of a mercury switch in a smooth, non-fiberglass, chemically resistant casing with weight and suspension wire of sufficient length to reach the remotely mounted control panel.

2.3.4 Pipe Bedding Materials: Backfill materials shall be as indicated with a minimum quality of 20% maximum loss by weight at four cycles, as tested by the magnesium sulfate soundness test.

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2.3.4.1 Lining: Clean, sound, crushed stone free from coatings. Lining shall have the following ASTM No. 67 gradation by weight:

% Passing	Sieve
100	1"
90-100	3/4"
20-55	3/8"
0-10	No. 4
0-5	No. 8

2.3.4.2 Special Backfill: Washed coarse sand, gravel or broken stone. The gravel or broken stone shall be well graded from fine to coarse. Special backfill shall have the following gradation by weight:

% Passing	Sieve
100	2"
30-65	1/4"
0-10	No. 200

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPELINES AND APPURTENANT CONSTRUCTION:

3.1.1 General Requirements for Installation of Pipeline: Apply except where specific exception is made in the following paragraph entitled, "Special Requirements".

3.1.1.1 Location: The work covered by this Section shall terminate at a point approximately 5 feet from the building, at a point of connection of existing systems.

3.1.1.2 Earthwork: Perform earthwork operations in accordance with Section 02220, "Excavation".

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3.1.1.3 Pipe Laying and Jointing: Inspect each pipe and fitting before and after installation; replace those found defective and remove from site. Provide proper facilities for lowering sections of pipe into trenches. Lay non-pressure pipe with the bell or groove ends in the upgrade direction. Adjust spigots in bells and tongues in grooves to give a uniform space all around. Blocking or wedging between bells and spigots or tongues and grooves will not be permitted. Replace by one of the proper dimensions, pipe or fittings that do not allow sufficient space for installation of joint material. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Provide batter boards not more than 25 feet apart in trenches for checking and ensuring that pipe invert elevations are as indicated. Laser beam method may be used in lieu of batter boards for the same purpose.

3.1.1.4 Connections to Existing Lines: Obtain approval from the Engineer before making connection to existing line. Conduct work so that there is minimum interruption of service on existing line. Use flexible FERNCO couplings to connect new piping systems to existing.

3.1.2 Special Requirements:

3.1.2.1 Installation of Cast Iron Soil Piping: Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled, "General Requirements for Installation of Pipelines" of this Section and with the recommendations of the pipe manufacturer. Make joints with the rubber gaskets specified for cast iron soil pipe joints and assemble in accordance with the recommendations of the pipe manufacturer.

3.1.2.2 Cleanouts: Construct cleanouts of cast iron soil pipe and fittings.

3.1.3 Concrete Work: Cast-in-place concrete is included in Section 03302, "Cast-In-Place Concrete (Minor Construction)".

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EXTERIOR SANITARY SEWER SYSTEM

3.1.4 Miscellaneous Construction and Installation:

3.1.4.1 Metal Work:

a. Workmanship and Finish: Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blowholes that may impair their strength or appearance. Give exposed surfaces a smooth finish with sharp well-defined lines and arrises. Provide necessary rabbets, lugs, and brackets wherever necessary for fitting and support. Install frames and covers as indicated on the Contract Drawings.

b. Field Painting: After installation, clean cast-iron frames, covers, gratings, and steps not buried in concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and apply a coat of bituminous paint. Do not paint surfaces subject to abrasion.

3.1.4.2 Holding Tank: Prior to installation of the septic tank, place 6 inches of granular fill compacted to minimum 95% Proctor Density below the unit base, extending minimum 1 foot beyond the sides of the unit. Install tank per manufacturer's instructions with watertight gaskets at all joints. Holding tank shall be watertight upon completion. Provide minimum 2-foot width of special backfill, full depth at the walls of the septic tank and over the septic tank as indicated.

3.2 FIELD QUALITY CONTROL:

3.2.1 Field Tests and Inspections: The Engineer will conduct field inspections and witness field tests specified in this Section. The Contractor shall perform field tests and provide labor, equipment, and incidentals required for testing. Be able to produce evidence, when required, that each item of work has been constructed in accordance with the drawings and Specifications.

3.2.2 Holding Tank: Upon completion of the holding tank, fill holding tank with water to provide a minimum 2-feet of static head. After stabilization of the filled tank, test the tank for period of not less than two hours with no leakage in that time.

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EXTERIOR SANITARY SEWER SYSTEM

3.2.3 Field Tests for Concrete: Field testing requirements are covered in Section 03302, "Cast-In-Place Concrete (Minor Construction)".

PART 4 - MEASUREMENT & PAYMENT:

4.1 MEASUREMENT - EXTERIOR SANITARY SEWER SYSTEM:

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

4.2 PAYMENT - EXTERIOR SANITARY SEWER SYSTEM:

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

END OF SECTION

SPECIFICATIONS

SECTION 13052

LANDFILL GAS VENTS

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.1.2 The work shall include but not necessarily be limited to:

- Excavation
- 6" Schedule 40 PVC Gas Vent Pipe with removable Gooseneck and bird screens
- Perforated 6" PVC Pipe as shown on Contract Drawings
- Type D Select Fill, Section 02226, or approved material
- Installation as shown on Contract Drawings
- Pipe boot for geomembrane cap installations or bentonite backfill for soil barrier layer cap installation

1.1.3 The Contractor shall maintain the installed gas vents free of any obstruction (cave-in, backfill) and damage during placement of the soil layers and until final acceptance of the work required by this Contract.

1.2 This Specification presents gas vent installation for both soil caps and geomembrane caps. Refer to Contract Drawings for type of installation required.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 PVC pipe, fittings and miscellaneous related materials as specified in Section 02435.

2.1.2 Type D select fill as specified in Section 02226 or approved alternate material.

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LANDFILL GAS VENTS

2.1.3 Geotextile, if required, as specified in Section 02072 and as shown on the Contract Drawings.

2.1.4 Common fill material as specified in Section 02257 and as shown on the Contract Drawings.

2.1.5 Geomembrane boot with associated materials as specified in Section 02595 or 02598 and as shown on the Contract Drawings.

PART 3 - EXECUTION

3.1 GAS VENT INSTALLATION:

3.1.1 Installation of the gas vent shall be completed as the layers for the final cap are placed.

3.1.2 After grading the in-place intermediate cover layer, excavation to install the gas vent shall be performed. A backhoe or power auger shall be used to excavate a minimum of 5 feet into the refuse. Contractor shall take precautions to prevent damage to the geotextile layers outside the vent excavation by cutting prior to penetration with power equipment. Excavation shall be in accordance with Section 02220.

3.1.3 The PVC pipe for the gas vent shall be centered in the excavation and backfilled with Type D select fill to the top of the intermediate cover layer. A coupling shall be installed on the PVC pipe such that there is about 6 inches of stick-up above the intermediate cover layer.

3.1.4 The geomembrane shall be cut to fit over the extended PVC pipe for the gas vent. A geomembrane boot shall be installed in accordance with the applicable Specification for the type of geomembrane being used.

3.1.5 The remainder of the PVC pipe for the vent shall be installed after the geosynthetics are installed. If additional layers of geosynthetics are to be placed in upper layers, an additional joint can be installed in the PVC pipe.

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LANDFILL GAS VENTS

3.1.6 Common fill soils shall be placed on the geotextile layer in the configuration as shown on the Contract Drawings and as specified in Section 02257.

PART 4 - MEASUREMENT & PAYMENT

4.1 DESCRIPTION:

4.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to install Type B (BGV) Gas Vents, as shown on the Contract Drawings, specified, or ordered by the Engineer.

4.2 WORK INCLUDED:

4.2.1 Work under this Item shall generally be comprised of but is not limited to:

- Furnished and installing all Type B (BGV) Gas Vents as shown on the Contract Drawings and Specification.
- Furnishing and installing all materials associated with all Type B (BGV) Gas Vents in accordance with the Contract Drawings and Specifications.
- All excavation associated with installation of Type B (BGV) Gas Vents.
- All backfill operations associated with installation of the Gas Vents.
- Survey locations of all Type B (BGV) Gas Vents
- Furnishing and installing all Select Fill Material associated with the Type B (BGV) Gas Vents.
- On-site disposal of any spoil material from drilling activities.
- Gas mitigation barrier system and vents at maintenance building.

4.3 RELATED WORK NOT INCLUDED:

4.3.1 The following Items of work closely related to Gas Vents are specifically not included under this Item:

- Type A Gas Vents (AGV)
- Select Fill Type A
- Select Fill Type B
- Select Fill Type D

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LANDFILL GAS VENTS

- Polyvinyl Chloride (PVC) Lining Material
- Low Linear Density Polyethylene (LLDPE) Lining Material
- Common Fill

4.4 BASIS FOR PAYMENT:

4.4.1 The quantity of Type B (BGV) Gas Vents for which payment will be made will be the actual number of Type B (BGV) Gas Vents, as shown on the Contract Drawings Sheet G-8 File No. 331.032-09F or as ordered by the Engineer.

No payment will be made under this Item for work performed by the Contractor to replace defective work or for work which is shown in the Contract Drawings, specified, or ordered by the Engineer.

END OF SECTION

SPECIFICATIONS

SECTION 13996

DRUM REMOVAL, STAGING AND DISPOSAL

1.1 DESCRIPTION:

1.1.1 Under this Item, the Contractor shall furnish all labor, materials, and equipment required to remove drums encountered during soil, debris and waste relocation activities. The drums shall be removed in accordance with the Contract Specifications.

2.1 WORK INCLUDED:

2.1.1 The work of this Item includes removal and sampling and waste characterization of subsurface drums encountered during surface soil, excavation and relocation operations including, but not limited to:

- Preparation and implementation of a Sampling and Waste Characterization Plan from drum removal activities.
- Construction of a drum staging area.
- Provision of evidence documentation.
- Compatibility sampling.
- Stabilization of drums.
- Transportation and temporary on-site storage in the staging area until disposal is directed by the Engineer.
- Sampling and analysis required for off-site disposal
- Additional loading, transportation and disposal in accordance with all State and Federal Regulations of drums in an Owner and NYSDEC approved facility.
- Preparation of Manifest forms for Owner signature.

SECTION 13996

DRUM REMOVAL, STAGING AND DISPOSAL

3.1 RELATED WORK NOT INCLUDED:

3.1.1 Work related to but specifically not included under this Payment Item includes:

- Health and Safety Plan
- Soil, Debris and Waste Relocation
- Construction Water Management
- Clearing and Site Preparation

4.1 BASIS OF PAYMENT:

4.1.1 The quantity of drums removed staged, transported and disposed of off-site for which payment will be made will be the actual number of drums removed and staged in accordance with the Contract Specifications.

No payment will be made under this Payment Item for on-site disposal of drums.

No payment will be made under this Payment Item for the sampling and waste characterization of drums not ordered by the Engineer.

No payment will be made under this Item for work performed by the Contractor to replace defective work, or for which work is not shown on the Contract Drawings, specified, or ordered by the Engineer.

END OF SECTION

SPECIFICATIONS

SECTION 13997

AUGERED HOLE ABANDONMENT

1.1 DESCRIPTION:

1.1.1 Under this Item, the Contractor shall furnish all labor, materials and equipment required to perform Augered Hole Abandonment, as ordered by the Engineer. Augered hole refusal will be defined as less than four linear feet of drilling completed in one-half hour under normal drilling operations.

2.1 WORK INCLUDED:

2.1.1 Work under this Item shall generally be comprised of the following:

- Augered Hole Abandonment not shown on the Contract Drawings, only as ordered by the Engineer due to unforseen conditions.
- Disposal of any waste to point of abandonment.
- Backfill of augered hole to point of abandonment.

3.1 RELATED WORK NOT INCLUDED:

3.1.1 The following items of work closely related to Augered Hole Abandonment, are specifically not included under this Item:

- Miscellaneous Excavation
- Rock Removal
- Type A Gas Vents (AGV)
- Type B Gas Vents (BGV)

SECTION 13997

AUGERED HOLE ABANDONMENT

4.1 PAYMENT:

4.1.1 The quantity of Augered Hole Abandonment for which payment will be made will be the actual number of lineal feet of Augered Hole Abandonment incorporated into the work, measured in place, as ordered by the Engineer.

No payment will be made under this Item for Augered Hole Abandonment not ordered by the Engineer.

END OF SECTION

SPECIFICATIONS

SECTION 16011

ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION:

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

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 basic designation only.

1.2.1 Federal Specification (Fed. Spec.):

L-P-387A	Plastic Sheet, Laminated, Thermosetting (for Design Plates)

1.2.2 American National Standards Institute (ANSI) Publications:

C37.20	Switchgear Assemblies, Including Metal-Enclosed Bus
Z35.1	Accident Prevention Signs

1.2.3 Institute of Electrical and Electronics Engineers (IEEE) Publication:

100	Standard Dictionary of Electrical and Electronics Terms

1.2.4 National Electrical Manufacturers Association (NEMA) Publication:

ICS 6	Enclosures for Industrial Controls and Systems

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ELECTRICAL GENERAL REQUIREMENTS

1.2.5 National Fire Protection Association (NFPA) Publication:

70B	Electrical Equipment Maintenance
70	National Electrical Code

1.3 APPLICATION: This Section applies to all sections of Division 16, "Electrical", of this Project except as specified otherwise in each individual section.

1.4 DEFINITION OF ELECTRICAL TERMS: Unless otherwise specified or indicated, electrical terms used in these Specifications, and on the drawings, shall be as defined in IEEE Standard No. 100.

1.5 SUBMITTALS: Obtain approval before procurement, fabrication, or delivery of items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Military, industry, and technical society publication references, and other information necessary to establish contract compliance of each item to be furnished. Furnish a minimum of six (6) copies of shop drawings for each major device specified.

1.5.1 Shop Drawings: In addition to the requirements specified elsewhere, shop drawings shall meet the following requirements. Drawings shall be a minimum of 8.5 inches by 11 inches in size, except as specified otherwise. Drawings shall include complete ratings information, wiring diagrams, and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If equipment is disapproved, revise drawings to show acceptable equipment and resubmit.

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1.5.2 Manufacturer's Data: Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

1.5.3 Publication Compliance: Where equipment or materials are specified to conform to industry and technical society publications of organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), and Underwriters' Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction", or words of similar meaning, to mean the Owner. In lieu of the label or listing, submit a certificate from an approved independent testing organization, adequately equipped and competent to perform such services, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's publication.

1.5.4 Submittals Required: Supply shop drawing submittal information on the following equipment and as otherwise noted in each individual Section:

Triplex Cable	Disconnect	Messenger Cable
Breaker	Anchor	CT Cable

1.6 OPERATION AND MAINTENANCE MANUAL: Submit as required for systems and equipment indicated in the technical sections. Furnish three copies, bound in hardback binders or an approved equivalent. Furnish one complete manual prior to performance of systems or equipment tests, and furnish the remaining manuals prior to contract completion. Inscribe the following identification on the cover: the words "OPERATION AND MAINTENANCE MANUAL", the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment. Include a table of contents and assemble the manual to conform to the table of contents, with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include:

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a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the system or equipment.

b. A control sequence describing startup, operation, and shutdown.

c. Description of the function of each principal item of equipment.

d. Installation and maintenance instructions.

e. Safety precautions.

f. Diagrams and illustrations.

g. Testing methods.

h. Performance data.

i. Lubrication schedule including type, grade, temperature range, and frequency.

j. Parts list. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.

k. Appendix: List qualified permanent servicing organizations for support of the equipment, including addresses and certified qualifications.

1.7 SPARE PARTS: Provide the following spare parts for all equipment installed under this Contract, unless indicated otherwise elsewhere.

a. Two (2) power fuses for each different size and type used.

b. Two (2) control fuses for each different size and type used.

c. Two (2) pilot lights for each different size and type used.

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1.8 POSTED OPERATING INSTRUCTIONS: Furnish approved operating instructions for systems and equipment indicated in the technical sections for use by operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal system and equipment. Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions as directed. Attach or post operating instructions adjacent to each principal system and equipment including startup, proper adjustment, operating, lubrication, shutdown, safety precautions, procedure in the event of equipment failure, and other items of instruction as recommended by the manufacturer of each system or equipment. Provide weather-resistant materials or weatherproof enclosures for operating instructions exposed to the weather. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.9 INSTRUCTION TO OWNER'S PERSONNEL: Where indicated in the technical sections, furnish the services of competent instructors to give full instruction to Owner's personnel in the adjustment, operation, and maintenance of systems and equipment, including pertinent safety requirements as required. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of man days (8 hours) of instruction furnished shall be as specified in each individual section.

1.10 DELIVERY AND STORAGE: Handle, store, and protect equipment and materials in accordance with the manufacturer's recommendations and with the requirements of NFPA 70B, Appendix I, titled "Equipment Storage and Maintenance During Construction". Replace damaged or defective items with new items.

1.11 SPECIAL CONDITIONS: The Contractor shall be performing work within active solid waste landfill site and shall be responsible to coordinate with the Owner regarding planned interruptions to electrical services and road access. Contractor must maintain in service the existing electrical services at the existing landfill facilities unless otherwise coordinated with the Owner.

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1.11.1 Protection of Existing Work: The Contractor shall take all necessary precautions to insure against damage to existing work to remain in place, or to be reused. The Contractor shall insure that structural elements are not overloaded and additional structural supports required as a result of any cutting, removal or demolition work performed under any part of this Contract are added. The Contractor shall minimize disruption of existing non-contract work areas as much as possible.

1.11.2 Upon damage to existing equipment, buildings, and/or structures, the Contractor shall immediately notify the Owner. All damages shall be repaired by the Contractor, or shall be replaced if beyond repair, to match the existing to the Owner's satisfaction.

1.11.3 Protection of Buildings from the Weather: The interior of the buildings and all materials and equipment shall be protected from the weather at all times.

1.11.4 Protection of Personnel: Where the safety of non-contractor personnel is endangered in the area of the work, barricades shall be used. Additional protection shall be provided if required, to preserve the safety of non-contractor personnel in the immediate area of the work.

1.11.5 Contractor shall maintain open road access at all times to the existing landfill and to the existing facilities. Contractor shall stage construction such that at least one lane of the existing access road is open at all times. Contractor shall coordinate with the Owner a minimum of one week prior to any planned road closings.

1.11.6 Construction in Existing Buildings: Verify with Owner expected routing of new wire and/or conduit within existing equipment or buildings prior to field construction of systems. Coordinate with the Owner a minimum of ten (10) working days prior to any planned disruption of existing working systems.

1.12 CATALOGED PRODUCTS/SERVICE AVAILABILITY: Materials and equipment shall be current products by manufacturers regularly engaged in the production of such products. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The 2-year period shall be satisfactorily completed by a

product for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished. The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the Contract.

1.13 MANUFACTURER'S RECOMMENDATIONS: Where installation procedures or any part thereof are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendations shall be cause for rejection of the equipment or material. Obtain manufacturer's recommendations from the Owner for equipment and/or material provided by the Owner.

1.14 MOTORS AND MOTOR CONTROLS FOR MECHANICAL EQUIPMENT: The electrical components of mechanical equipment, such as motors, motor starters, control or push button stations, float or pressure switches, solenoid valves, and other devices functioning to control mechanical equipment, and control wiring and conduit for circuits rated 100 volts or less, are specified in the section covering the associated mechanical equipment, rather than in Division 16, unless otherwise shown. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and conduit, and the electrical power circuits shall be furnished and installed under Division 16.

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ELECTRICAL GENERAL REQUIREMENTS

1.15 EQUIPMENT FURNISHED BY OTHERS:

CONTRACT NO.	ITEM	FURNISHED INSTALLED	FURNISHED ONLY	WORK BY D

NOTE KEY

1 - Power & Control Wiring & Conduit
2 - Control Wiring & Conduit
3 - Push Button Stations
4 - Starters
5 - Mount Equipment
6 - Disconnect
7 - Power Wiring & Conduit
8 - Timer Switch

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: All materials, equipment, and devices shall, as a minimum, meet the requirements of UL where UL standards are established for those items, and the requirements of NFPA 70. All items shall be new unless specified or indicated otherwise.

2.2 NAMEPLATES: Fed. Spec. L-P-387. Provide laminated plastic nameplates for each panelboard, equipment enclosure, relay, switch, and device. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic, 0.125-inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the black core. Minimum size of nameplates shall be 1.0 inch by 2.5 inches. Lettering shall be a minimum of 0.25-inch high normal block style.

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PART 3 - EXECUTION

3.1 NAMEPLATE MOUNTING: Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two sheet-metal screws or two rivets.

3.2 PAINTING OF EQUIPMENT:

3.2.1 Factory Applied: Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test, except equipment specified to meet requirements of ANSI C37.20 shall have a finish as specified in ANSI C37.20.

3.3 TESTS:

3.3.1 General: Perform and record all tests in the presence of the Owner's authorized representative and/or the Engineer. Furnish all instruments and personnel. Perform preliminary tests and correct all defective material and/or workmanship prior to witness of tests. Perform tests as indicated and as otherwise noted in other Sections of the 1600 Division.

3.3.2 Conduct field tests in the sequence listed below:

3.3.2.1 Insulation Resistance Tests: Make tests after all wiring is completed and connected ready for the attachment of fixture and/or equipment. Repeat test when all fixtures and/or equipment are connected ready for use. Make tests with an instrument capable of measuring the resistance involved at a voltage of at least 500 volts DC for equipment rated 100 to 500 volts AC, 1500 volts DC for equipment rated 151 to 600 volts AC. Apply voltage continuously for one minute prior to taking reading. Measure insulation resistance between each pair of insulated conductor separately and between each insulated conductor and ground. Make tests at each panelboard distribution panel, and switchboard on every circuit with the circuit protective device open but connected. The minimum acceptable measured insulation resistance for wiring completed and ready for connection of fixtures and/or equipment is:

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WIRE SIZE	INSULATION RESISTANCE
#14 & #12 AWG	1,000,000 Ohms
#10 AWG & Larger	250,000 Ohms

3.3.2.2 For wiring completed with all fixtures and/or equipment connected, the minimum acceptable insulation resistance is one-half the tabled values.

3.3.3 Load Balance Test: Make test by energizing all lighting, motors and other electrical equipment simultaneously for a three hour period. Alter fuses, circuit breakers, circuit connections, etc., as required for satisfactory performance. Take voltage and amperage readings on each circuit at all panels.

3.3.4 Check the amperage draw, voltage and direction of rotation of each motor in the presence of the equipment contractor and the Owner's representative. Make all necessary changes to obtain proper rotation, motor terminal voltage, motor protection, etc. Revise heater elements as necessary for proper motor protection. Similarly check all other electrically connected equipment.

Make the test at a time during the day or night that is mutually satisfactory to the Owner at least one week prior to substantial completion. Make all arrangements and notify all parties in writing at least seventy-two hours prior to the test.

3.3.5 Equipment Operation Test - Show by demonstration in service that all circuits are in good operating condition. Cycle all control equipment under load at least five times.

3.3.6 Equipment and apparatus factory tests - Manufacturer's normal quality control tests are acceptable, unless specific factory witnessed tests are specified in other sections.

3.4 CLEANING:

3.4.1 When directed, just prior to final acceptance, clean all equipment including, but not limited to, the following:

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- Lighting fixtures, panelboards, control centers, switchgear, receptacles and switch plates - Remove all tags and labels; leave ready for use - All equipment to be painted, removing all rust, etc., and leave ready for painting - Building, by removing all debris, conduits, wire, insulation, cartons, etc., left as a result of this work.

3.5 UTILITY COORDINATION:

3.5.1 Contractor shall coordinate with Owner regarding the electric service.

3.5.2 Contractor shall coordinate with the Owner and the Local Telephone Company regarding telephone service requirements and connection.

3.5.3 Contractor shall coordinate with the Owner regarding connections to existing systems and work within existing buildings and equipment.

3.6 WORK WITHIN EXISTING BUILDINGS:

3.6.1 Contractor shall install new systems as shown and shall install new conduit and wire systems within existing buildings. Contractor shall use care in installation of new work and shall protect existing work and finishes in his work area. Contractor shall immediately notify Owner of any damages to existing equipment or finishes and shall restore damaged items to Owner's satisfaction.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - ELECTRICAL GENERAL REQUIREMENTS:

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

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4.2 PAYMENT - ELECTRICAL GENERAL REQUIREMENTS:

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

END OF SECTION

SPECIFICATIONS

SECTION 16301

UNDERGROUND ELECTRICAL WORK

PART 1 - GENERAL

1.1 DESCRIPTION:

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

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 basic designation only.

1.2.1 Federal Specification (Fed. Spec.):

RR-F-621C	Frame, Covers, Gratings, Steps, Sump and Catch Basin, Manhole

1.2.2 American Association of State Highway and Transportation Officials (AASHTO) Publications:

HB-12	Highway Bridges, Including Interim Specifications
M 198	Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets

1.2.3 American Concrete Institute (ACI) Publications:

315	Details and Detailing of Concrete Reinforcement
318	Building Code Requirements for Reinforced Concrete

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1.2.4 American National Standards Institute (ANSI) Publication:

C2	National Electrical Safety Code (NESC)

1.2.5 American Society for Testing and Materials (ASTM) Publications:

B1	Hard-Drawn Copper Wire
B8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
C32	Sewer and Manhole Brick (Made from Clay or Shale)
C260	Air-Entraining Admixtures for Concrete
C309	Liquid Membrane-Forming Compounds for Curing Concrete
D698	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49-kg) Rammer and 12-in. (305-mm) Drop
D1556	Density of Soil in Place by the Sand-Cone Method
D1557	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop
D1682	Breaking Load and Elongation of Textile Fabrics

1.2.6 Association of Edison Illuminating Companies (AEIC) Publications:

1	Impregnated-Paper-Insulated Lead Covered Cable, Solid Type (10th Edition)

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CS5	Polyethylene and Crosslinked Polyethylene Insulated Shielded Power Cables Rated 5 through 69 KV (6th Edition)
CS6	Ethylene Propylene Rubber Insulated Shielded Power Cables Rated 5 through 69 KV (3rd Edition)

1.2.7 Institute of Electrical and Electronics Engineers (IEEE), Inc. Publication:

48	IEEE Standard Test Procedures and Requirements for High-Voltage Alternating-Current Cable Terminations

1.2.8 National Electrical Manufacturer's Association (NEMA) Publications:

RN 1	Polyvinyl-Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
TC 2	Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
TC 3	PVC Fittings for Use With Rigid PVC Conduit and Tubing
TC 6	PVC and ABS Plastic Utilities Duct for Underground Installation
TC 9	Fittings for ABS and PVC Plastic Utilities Duct for Underground Installation
WC 7	Cross-Linked-Thermosetting- Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (ICEA S-66-524)
WC 8	Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (ICEA S-68-516)

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UNDERGROUND ELECTRICAL WORK

1.2.9 National Fire Protection Association (NFPA) Publication:

70	National Electrical Code (NEC)

1.2.10 U.S. Department of Agriculture, Rural Electrification Administration (REA) Bulletins:

344-2	List of Materials Acceptable for Use on Telephone Systems of REA Borrowers
345-6	Splicing Plastic-Insulated Cables (PC-2)
345-14	Direct Burial Telephone Cable (Air Core) (PE-23)
345-26	Buried Plant Housings (PE-35)
345-67	Filled Telephone Cables (PE-39)

1.2.11 Underwriters' Laboratories Inc. (UL) Publications:

6	Rigid Metal Conduit
467	Grounding and Bonding Equipment
510	Insulating Tape
514A	Metallic Outlet Boxes
514B	Fittings for Conduit and Outlet Boxes
854	Service-Entrance Cables
1242-83	Intermediate Metal Conduit

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UNDERGROUND ELECTRICAL WORK

1.3 GENERAL REQUIREMENTS: Section 16011, "Electrical General Requirements", applies to this Section with additions and modifications specified herein.

1.3.1 Underground Service: Terminate underground service as noted, except that service conductors shall be continuous to the terminating point indicated. Connections of the underground service to the service switch, panelboard, or load center is included in Section 16402, "Exterior/Interior Wiring Systems". Protect ends of underground conduit with threaded metal caps until connections are made.

1.3.2 Overhead Service: Terminate overhead service conductors at the exterior service entrance fittings or weatherhead. Installation and connection of service entrance equipment to the overhead service conductor is included in Section 16402, "Exterior/Interior Wiring Systems". Locate nearby support bracket for overhead wires not less than 16 feet above the finished grade at the building.

1.3.3 Electrical Characteristics: Electrical characteristics for this project shall be 240/120 volt, 1 phase, 3 wire.

1.3.4 Laboratory Tests:

1.3.4.1 Determine soil-density relationships as specified for soil tests in Section 02200, "Earthwork."

1.4 SUBMITTALS:

1.4.1 Field Tests:

Ground resistence test

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: Provide materials and equipment listed by UL or approved by Factory Mutual (FM) System when such equipment is listed or approved.

2.1.1 Conduit: Shall be plastic conforming to the following:

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UNDERGROUND ELECTRICAL WORK

2.1.1.2 Plastic conduit for direct burial shall be PVC conforming to NEMA TC 2 (conduit) and NEMA TC 3 (fittings), Type EPC-80-PVC.

2.1.1.3 Outlet boxes for use with rigid or flexible steel conduit shall be cast-metal cadmium or zinc-coated if of ferrous metal with gasketed closures and shall conform to UL 514A. Fittings for steel conduit and outlet boxes shall conform to UL 514B.

2.1.2 Plastic Insulating Tape: UL 510.

2.1.3 Wire and Cable:

2.1.3.1 Wire and cable conductor sizes are designated by American Wire Gauge (AWG) and Thousands of Circular Mils (MCM). Conductor and conduit sizes indicated are for copper conductors, unless otherwise noted. Insulated conductors shall bear the date of manufacture imprinted on the wire insulation with other identification. Wire and cable manufactured more than 24 months before delivery to the job site shall not be used.

2.1.3.2 Conductors rated 600 volts and less, including service entrances, shall conform to UL 854, Type USE. Conductor size and number of conductors in each cable shall be as indicated. Cable shall be color coded. Conductor identification shall be provided within each enclosure where a tap, splice, or termination is made. Conductor identification shall be by color-coded insulated conductors, plastic-coated self-sticking printed markers, colored nylon cable ties and plates, or heat shrink type sleeves. Control circuit terminations shall be properly identified. Conductors shall be stranded copper.

a. Colors for coding conductors shall be:

240 -VOLT SYSTEM

Neutral - White
Phase A - Black
Phase B - Red
Grounding Conductor - Green

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UNDERGROUND ELECTRICAL WORK

2.1.3.3 Pull Wire: Shall be plastic, having a minimum tensile strength of 200 pounds.

2.1.3.4 Connectors and Terminals: Shall be designed and approved for use with the associated conductor material, and shall provide a uniform compression over the entire contact surface. Solderless terminal lugs shall be used on stranded conductors. For connecting aluminum to copper, connectors shall be the circumferentially compressed, metallurgically bonded type.

2.1.4 Grounding and Bonding Equipment: UL 467. Ground rods shall be copperweld type copper clad steel with diameter adequate to permit driving to full length of the rod, but not less than 3/4 inch in diameter and 10 feet long unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION: Underground installation shall conform to ANSI C2 and NFPA 70 except as otherwise specified or indicated.

3.1.1 Contractor Damage: The Contractor shall promptly repair any indicated utility lines or systems damaged by Contractor operations. Damage to lines or systems not indicated, which are caused by Contractor operations, shall be treated as "Changes" under the terms of the General Provisions of the Contract. If the Contractor is advised in writing of the location of a non-indicated line or system, such notice shall provide that portion of the line or system with "indicated" status in determining liability for damages. In any event, the Contractor shall immediately notify the Engineer of any such damage.

3.1.2 Underground Duct Without Concrete Encasement: Conduits shall be PVC, Type EPC-80.

3.1.2.1 The top of the conduit shall be not less than 24 inches below grade, shall have a minimum slope of 3 inches in each 100 feet away from buildings and toward manholes and other necessary drainage points, and shall run in straight lines except where a change of direction is necessary. As each conduit run is completed, a testing mandrel not less than 12 inches long with a diameter 1/4 inch less than the inside diameter of the conduit shall be drawn through each conduit, after which a stiff-bristled brush shall be drawn through until the conduit is clear of earth, sand, or gravel particles. Conduit plugs shall then immediately be installed. Ensure a minimum 3-inch clearance from the conduit to each side of the trench. Grade the bottom of the

trenches smooth; where rock, soft spots, or sharp-edged materials are encountered, excavate the bottom for an additional 3 inches; fill with sand or earth, free from particles that would be retained on a 1/4-inch sieve; and tamp level with the original bottom.

3.1.2.2 Duct banks shall have a continuous slope downward toward underground structures and away from buildings with a minimum pitch of 3 inches in 100 feet. Except at conduit risers, changes in direction of runs exceeding a total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet; sweep bends may be composed of one or more curved or straight sections or combinations thereof. Manufactured bends shall have a minimum radius of 18 inches for use with conduits of less than 3 inches in diameter and a minimum radius of 36 inches for ducts of 3 inches in diameter and larger. Excavate trenches along straight lines from structure to structure before ducts are laid or structure constructed so the elevation can be adjusted, if necessary, to avoid unseen obstruction.

3.1.2.3 Connections to Existing Ducts: Where connections to existing duct banks are indicated, excavate the banks to the maximum depth necessary. Remove existing cables which constitute interference with the work. Abandon in place the unused ducts and cables which do not interfere with the work.

3.1.3 Buried Utility Warning and Identification Tape: Provide detectable aluminum foil plastic-backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried cable and conduit. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 2 inches minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED [ELECTRIC] [TELEPHONE] CABLE BELOW or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth of 12 inches below the top surface of earth or the top surface of the subgrade under pavements.

3.1.4 Reconditioning of Surfaces:

3.1.4.1 Unpaved surfaces disturbed during the installation of duct or direct burial cable shall be restored to the original elevation and condition. Sod or topsoil shall be preserved carefully and replaced after the backfilling is completed. Replace damaged sod with sod of equal quality. Where the surface is disturbed in a newly seeded area, the disturbed surface shall be reseeded with the same quantity and formula of seed as that used in the original seeding.

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UNDERGROUND ELECTRICAL WORK

3.1.4.2 Paving Repairs: Where trenches, pits, or other excavations are made in existing roadways and other areas of pavement where surface treatment of any kind exists, such surface treatment or pavement shall be restored to the same thickness and in the same kind as previously existed, except as otherwise specified, and to match and tie into the adjacent and surrounding existing surfaces in a neat and acceptable manner.

3.1.5 Cable Pulling: Test existing ducts with a mandrel and thoroughly swab out to remove foreign material before the pulling of cables. Cables shall be pulled down grade with the feed-in point at the manhole or buildings of the highest elevation. Cable lubricants shall be soapstone, graphite, or talc for rubber- or plastic-jacketed cables. Cable-pulling tensions shall not exceed the maximum pulling tension recommended by the cable manufacturer. Do not exceed the specified cable bending radii when installing cable under any conditions, including turnups into switches, transformers, switchgear, switchboards, and other enclosures. Cable with tape shield shall have a bending radius not less than 12 times the overall diameter of the completed cable. Cable with wire shield shall have a bending radius not less than eight times the overall diameter of the completed cable. If basket-grip type cable-pulling devices are used to pull cable in place, cut off the section of cable under the grip before splicing and terminating.

3.1.5.1 Secondary cable runs, 600 volts and less, shall include an insulated copper equipment grounding conductor sized as required by the rating of the overcurrent device supplying the phase conductors.

3.1.6 Excavating, Backfilling, and Compacting: Excavate underground structures to depths indicated. If hard material is encountered, the provisions of the contract respecting an adjustment for changed conditions shall apply, subject to the requirements of notification thereunder being given. Hard material shall be defined as solid rock; firmly cemented unstratified masses; conglomerate deposits possessing the characteristics of solid rock not ordinarily removed without systematic drilling and blasting; or any boulder, masonry, or concrete (except pavement) exceeding 1/2 cubic yard in volume.

3.1.6.1 Excavated materials not required or suitable for backfill shall be wasted on the project site as directed. Provide sheeting and shoring as necessary for protection of work and safety of personnel. Remove water from excavation by pumping or other approved method.

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3.1.6.2 Backfilling around structures shall consist of earth, loam, sand-clay, or sand and gravel, free from large clods of earth or stones over 1 inch in size. Backfill materials shall be placed symmetrically on all sides in loose layers not more than 9 inches deep. Each layer shall be moistened, if necessary, and compacted with mechanical or hand tampers to 90 percent compaction.

3.1.6.3 Backfilling Trenches: Place backfill in layers not more than 6 inches thick, and compact each layer. Backfilling shall progress as rapidly as the construction, testing, and acceptance of the work permits. Backfill shall be free from roots, wood scrap material, and other vegetable matter and refuse. Compaction of backfill shall be to 90 percent of ASTM D698 density. The first layer shall be earth or sand, free from particles that would be retained on a 1/4-inch sieve and extending not less than 3 inches above the top of the conduit or cables. The succeeding layers shall be excavated material having stones no larger than would pass through a 4-inch ring. The backfill may be moistened. The backfill shall be level with the adjacent surface, except that in sodded areas, leave a space equal to the thickness of the sod.

3.1.7 Cable Terminating: Protect terminations of insulated power and lighting cables from accidental contact, deterioration of coverings, and moisture by the use of terminating devices and materials. Make terminations by using materials and methods indicated or specified herein or as designated by the written instruction of the cable manufacturer and termination kit manufacturer. Terminations of single- and multiconductor cables shall include the securing and sealing of the sheath and insulation of the cable conductors, stress relief and grounding of cable shields of shielded cable, and grounding of neutral conductors, metallic sheaths, and armor. Adequately support cables and cable terminations to avoid any excessive strain on the termination and the conductor connection.

3.1.7 Splices for 600-Volt Class Cables: Splices in underground systems shall be made only in accessible locations such as manholes and hand holes, using a compression connector on the conductor and by insulating and waterproofing by one of the following methods suitable for continuous submersion in water.

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3.1.7.1 Cast-type splice insulation shall be provided by means of a molded casting process employing a thermosetting epoxy resin insulating material which shall be applied by a gravity-poured method or by a pressure-injected method. The component materials of the resin insulation shall be in a packaged form ready for convenient mixing without removing from the package. Do not allow the cables to be moved until after the splicing material has completely set.

3.1.7.2 Gravity-poured method shall employ materials and equipment contained in an approved commercial splicing kit which includes a mold suitable for the cables to be spliced. When the mold is in place around the joined conductors, prepare and pour the resin mix into the mold. Do not allow cables to be moved until after the splicing materials have completely set.

3.1.7.3 Terminating Aluminum Conductors:

a. Use particular care in making up joints and terminations. Remove surface oxides by cleaning with a wire brush or emery cloth. Apply joint compound to conductors, and use UL-listed solid aluminum connectors for connecting aluminum to aluminum conductors. When connecting aluminum to copper conductors, use connectors specifically designed for this purpose.

3.1.8 Grounding: Noncurrent-carrying metallic parts associated with electrical equipment shall have a maximum resistance to solid earth ground not exceeding the following values:

Grounded secondary distribution system neutral and noncurrent-carrying metal parts associated with distribution systems and grounds not otherwise covered	25 ohms

When work in addition to that indicated or specified is directed in order to obtain the specified ground resistance, the provisions of the Contract covering "Changes" shall apply.

3.1.8.1 Grounding electrodes shall be cone-pointed ground rods, driven full depth plus 6 inches, installed when indicated to provide an earth ground of the appropriate value for the equipment being grounded.

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3.1.8.2 Grounding connections which are buried or otherwise normally inaccessible, and excepting specifically those connections for which access for periodic testing is required, shall be made by exothermic weld or compression connector. Exothermic welds shall be made strictly in accordance with the weld manufacturer's written recommendations. Welds which are "puffed up" or which show convex surfaces, indicating improper cleaning, are not acceptable. Mechanical connectors are not required at exothermic weldments. Compression connector shall be the type which uses a hydraulic compression tool to provide the correct circumferential pressure. Tools and dies shall be as recommended by the manufacturer. An embossing die code or other standard method shall provide visible indication that a connector has been adequately compressed on the ground wire.

3.1.8.3 Grounding conductors shall be stranded-bare copper conforming to ASTM B8, Class B, for sizes No. 6 AWG and larger, and shall be solid-bare copper conforming to ASTM B1 for sizes No. 8 and smaller. Cable sheaths, cable shields, conduit, and equipment shall be grounded with No. 6 AWG. Surge arresters shall be grounded to ground rods with No. 4 AWG.

3.2 FIELD TESTS: As an exception to requirements that may be stated elsewhere in the Contract, notify the Engineer in writing at least 5 working days prior to tests. Furnish labor, equipment, and incidentals required for testing. Correct defects in the work provided by the Contractor and repeat tests until the work is in compliance with contract requirements. Show by demonstration in service that circuits and devices are in good operating condition. Tests shall be such that each item of control equipment will function not less than five times.

3.2.1 Distribution Conductors 600-Volt Class: After wiring is completed and connected ready for operation, but prior to placing systems in service and before any branch circuit breakers are closed, perform insulation resistance tests in all circuits. Measure the insulation resistance between conductors and between each conductor and ground. Use an instrument capable of making measurements at an applied potential of 500 volts. Take readings after the voltage has been applied for a minimum of 1 minute. The minimum insulation resistance for circuits of No. 12 AWG conductors shall be 1,000,000 ohms.

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3.2.2 Ground Rods: Test ground rods for ground resistance value before any wire is connected. Perform ground resistance measurements in normally dry weather, not less than 48 hours after rainfall. Ground resistance shall also be measured for each piece of equipment to the ground electrode. Use a portable ground testing megger to test each ground or group of grounds. The instrument shall be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the ground electrode under test. Provide one copy of the ground megger manufacturer's directions, indicating the method to be used.

3.2.3 Compaction: Backfill shall be tested in accordance with ASTM D1556, one test per lift per 2000 square feet.

3.2.4 Test Report:

a. 600-Volt Cables: Identify each cable and test result.

b. Grounding Electrodes and Systems: Identify electrodes and systems for each test, as well as the resistance and soil conditions at the time the measurements were made.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - UNDERGROUND ELECTRICAL WORK:

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

4.2 PAYMENT - UNDERGROUND ELECTRICAL WORK:

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

END OF SECTION

SPECIFICATIONS

SECTION 16302

OVERHEAD ELECTRICAL WORK

PART 1 - GENERAL

1.1 DESCRIPTION:

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

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 basic designation only.

1.2.1 Association of Edison Illuminating Companies (AEIC) Publications:

CS5	Specifications for Polyethylene and Cross-Linked Polyethylene Insulated Shielded Power Cables Rated 5 through 69 kV (6th Edition)
CS6	Specification for Ethylene Propylene Rubber Insulated Shielded Power Cables Rated 5 through 60 KV (3rd Edition)

1.2.2 American National Standards Institute, Inc. (ANSI) Publications:

B16.11	Forged Steel Fittings, Socket-Welded and Threaded
C2	National Electrical Safety Code
C12.10	Watt-Hour Meters
C12.11	Instrument Transformers for Metering Purposes, 15 KV and Less
C29.2	Wet Process Porcelain Insulators and Toughened Glass Insulators (Suspension Type)

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C29.3	Wet Process Porcelain Insulators (Spool Type)
C29.4	Wet Process Porcelain Insulators (Strain Type)
C29.5	Wet Process Porcelain Insulators (Low and Medium Voltage Pin Type)
C29.7	Wet Process Porcelain Insulators (High Voltage Line-Post Type)
C37.32	Schedules of Preferred Ratings, Manufacturing Specifications and Application Guide for High Voltage Air Switches, Bus Supports, and Switch Accessories
C37.42	Distribution Cutouts and Fuse Links
C37.43	Distribution Fuse Cutout Links for Use in Distribution Enclosed, Open, and Open-Link Cutouts
C57.12.20	Overhead Type Distribution Transformers 500 KVA and Smaller: High Voltage 67,000 Volts and Below: Low Voltage, 15,000 Volts and Below
O5.1	Specifications and Dimensions for Wood Poles
Z55.1	Gray Finishes for Industrial Apparatus and Equipment

1.2.3 American Society for Testing and Materials (ASTM) Publications:

A120	Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary uses
A153	Zinc-coating (Hot-Dip) on Iron and Steel Hardware

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A475	Zinc-Coated Steel Wire Strand
B1	Hard-Drawn Copper Wire
B2	Medium Hard-Drawn Copper Wire
B3	Soft or Annealed Copper Wire
B8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium Hard, or Soft
B228	Concentric-Lay-Stranded Copper-Clad Steel Conductors
B231	Concentric-Lay-Stranded Aluminum 1350 Conductors
B232	Concentric-Lay-Stranded Aluminum Conductors, Coated Steel Reinforced (ACSR)
B397	Concentric-Lay-Stranded 500-H19 Aluminum-Alloy 5005-H19 Conductors
B399	Concentric-Lay-Stranded Aluminum-Alloy 6201-T81 Conductors

1.2.4 American Wood-Preservers' Association (AWPA) Publications:

C1	All Timber Products - Preservative Treatment by Pressure Processes
C4	Poles Preservative Treatment by Pressure Process
C25	Standard for the Preservative Treatment of Cross Arms by the Pressure Process

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M6	Brands Used on Forest Products

1.2.5 Institute of Electrical and Electronic Engineers (IEEE) Publication:

48	High Voltage Alternating Current Cable Terminations

1.2.6 National Electrical Manufacturers Association (NEMA) Publications:

LA1	Surge Arresters
SG13	Automatic Circuit Reclosers, Automatic-Line Sectionalizers, and Oil Filled Capacitor Switches for Alternating Current Systems
TC2	Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
TC3	PVC Fittings for Use with Rigid PVC Conduit and Tubing
TR1	Transformers, Regulators, and Reactors
WC7	Cross-Linked Thermosetting Polyethylene Insulated Wire and Cable for the Transmission and Distribution of Electric Energy (IPCEA S-66-52A)
WC8	Ethylene-Propylene-Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (IPCEA S-68-516)

1.2.7 National Fire Protection Association (NFPA) Publication:

70	National Electrical Code

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1.2.8 Rural Electrification Administration (REA) Publications:

43-5	List of Materials Acceptable for Use On Systems of REA Electrification Borrowers
44-3	Wood Cross Arms (Solid and Laminated), Transmission Timbers and Pole Keys (DT-5B/PE-16), DEC
50-17	REA Specification DT-5C for Wood Poles, Stubs, and Anchor Logs

1.2.9 Underwriters' Laboratories, Inc. (UL) Publications:

6	Rigid Metallic Conduit
83	Thermoplastic-Insulated Wires & Cables
510	Insulating Tape

1.3 GENERAL REQUIREMENTS: Section 16011, "Electrical General Requirements", applies to this Section with additions and modifications specified herein.

1.3.1 Overhead Service: Overhead service conductors into buildings shall terminate at the service entrance fittings or weather head outside the building. The installation and connection of service entrance equipment to the overhead service conductor is included in Section 16402, "Interior Wiring Systems". The nearby support bracket for the overhead wires shall be not less than 16 feet above the finished grade at the building.

1.3.2 Electrical Characteristics: Electrical characteristics for this project shall be 240/120 volt, single phase, three wire.

1.3.3 Connections to Existing Electrical Systems: Notify the Engineer in writing at least 15 days prior to the date the connections are required; approval shall be received before any service is interrupted. Furnish all material required to make connections into the existing systems, and perform all excavating, backfilling, and other incidental labor as required. Coordinate with Owner any service interruption prior to the actual work.

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OVERHEAD ELECTRICAL WORK

1.4 SUBMITTALS: Submit the following:

1.4.1 Manufacturer's Catalog Data:

a. Triplex Cable

b. Messenger Cable

c. CT Cable

d. Anchor

1.4.2 Test Reports:

a. Pressure-treated wood pole

The REA approved Quality Mark "WQC" on each pole will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWPA treatment standards.

1.5 QUALITY ASSURANCE:

1.5.1 Pressure-Treated Wood Poles: The Contractor shall be responsible for the quality of treated wood poles. Each pole shall be permanently marked or branded, by the producer, in accordance with AWPA M6, and REA 50-17.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: Materials specified herein or shown on the contract drawings which are identical to materials listed in REA 43-5 shall be considered as conforming to all requirements.

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2.2 POLES: Wood poles machine trimmed by turning, Southern Yellow Pine conforming to ANSI O5.1 and REA 50-17. Poles must be gained, bored and roofed before treatment. Poles shall be treated in accordance with AWPA C1 and AWPA C4 as referenced in REA 50-17. The quality of each pole shall be assured with the "WQC" (Wood Quality Control) Brand on each piece, or by an approved inspection agency test report.

2.3 HARDWARE: Pole line hardware shall be hot dip galvanized conforming to ASTM A153.

2.4 INSULATORS: Wet-process porcelain insulators which are radio interference freed.

a. Guy strain insulators shall be class 54-1 ANSI C29.4]

2.5 CONDUCTORS: Overhead conductors of the sizes and types indicated.

2.5.1 Secondary-Service Conductors: Aerial Service Secondary conductors shall be aluminum triplex with 300 volt cross-linked polyethylene insulation on the phase wires. The neutral shall be bare ACSR aluminum alloy messenger.

2.5.2 Guy Strand: Conforming to ASTM A475 Grade extra high strength Class A or B, galvanized Strand Steel Cable. Guy strand shall be 3/8 inch in diameter with a minimum breaking strength of 15,400 pounds guy strand type, and size will be automatic or 3-bolt clamp guy terminations designed for use with the particular strand and developing at least the ultimate breaking strength of the strand.

2.5.3 Messenger Cable: Conforming to ASTM B228, Grade 30 EHS galvanized steel.

2.5.4 CT Cable: Cable shall be sunlight resistant multi conductor, rated minimum of 300 volts. Cable shall be rated for aerial use where supported by messenger cable. Conductors shall be stranded copper with EPR insulation. Multi conductors shall be assembled into round cable. Exterior of assembled cable shall have overall CSPE (Hypalon) sunlight resistant jacket. Manufacturer shall be American Insulated Wire Corp, Type EP-40 TC Control Cable, or equal.

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2.5.5 Aerial Telephone Cable: Cable shall be 25 pair, 24 AWG copper with HDP insulation, telephone industry color coding wires, twisted pairs with varying lays, overall high dielectric - non-hygroscopic binding tape, tape shielding over all with black - sunlight resistant low density polyethylene outer jacket (verify acceptable cable with local telephone company).

2.5.5.1 Aerial Telephone Cable Messenger Assembly shall consist of 1/4-inch EHS galvanized steel messenger strand supported from poles, with messenger rings, stainless steel cable straps or other approved non-corrosive metal lashings at 15 inch spacing supporting telephone cable. Clearance from power wires shall be per local phone company standards. Coordinate with local phone company regarding connections at each of the lines to the existing systems.

2.6 GUY GUARDS: Guy guards shall be plastic, yellow colored, 8 feet long and resistant to sub-zero temperatures.

2.6.1 Guy Attachment: Thimble eye guy attachment with a lift plate on the down side.

2.7 ANCHORS AND ANCHOR RODS: Anchors and anchor rods shall be, plate anchors presenting the holding area indicated on the drawings as a minimum. Anchor rods shall be twin thimble-eye, 3/4 1 inch diameter by 8 feet long and must be hot dip galvanized. As described below.

2.7.1 Plate Anchors: Plate type anchors shall have an area of at least 150 square inches, and shall be rated by the manufacturer for pounds or more in "Class 4" soil.

2.8 GROUND RODS: Shall be of copper clad steel sectional type ground rods at least 3/4 inch in diameter and 10 feet. Die-stamp each near the top with the name or trademark of the manufacturer and the length of the rod in feet. The rods shall have a hard, clean, smooth, continuous, surface throughout the length of the rod.

2.8.1 Ground Wire: Soft drawn copper wire ground conductors shall be no smaller than No. 6 AWG. Ground wire protectors may be either PVC or half round wood molding.

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2.9 CONDUIT RISERS AND CONDUCTORS: Schedule 80 PVC conduit conforming to NEMA TC2, Type EPC-80-PVC and NFPA 70, with fittings conforming to NEMA TC3 for the entire portion of the riser.

2.9.1 Secondary Riser: 600 volt riser conductors shall be copper, THWN conforming to UL 83.

2.10 ELECTRICAL TAPES: Tapes shall be UL listed for electrical insulation and other purposes in wire and cable splices. Terminations, repairs and miscellaneous purposes. Electrical tapes shall comply with UL 510.

2.11 CALKING COMPOUND: Compound for the sealing of conduit risers shall be of a putty like consistency workable with the hands at temperatures as low as 35 degrees F, shall not slump at a temperature of 300 degrees F, and shall not harden materially when exposed to air. The compound shall readily calk or adhere to clean surfaces of the materials with which it is designed to be used. The compound shall have no injurious effects upon the hands of workmen or upon the materials.

PART 3 - EXECUTION

3.1 INSTALLATION: Provide overhead pole line installation conforming to the requirements of ANSI C2 for Grade B construction of overhead lines in heavy loading districts and NEC for overhead services.

3.1.1 Pole Setting: Pole holes shall be at least as large at the top as at the bottom and shall be large enough to provide 4-inch clearance between the pole and the side of the hole.

3.1.1.1 Setting Depth of Pole: Pole setting depths shall be as follows:

Length of Pole (feet)	Setting in Soil (feet)
30	5.5

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3.1.1.2 Setting in Soil, Sand, and Gravel: "Setting in Soil" depths shall apply where pole holes are in soil, sand, or gravel or any combination of these; where the soil layer over solid rock is more than 2 feet deep; where the hole in solid rock is not substantially vertical; or where the diameter of the hole at the surface of the rock exceeds twice the diameter of the pole at the same level. At corners, dead ends and other points of extra strain, poles shall be set 6 inches deeper.

3.1.1.3 Setting on Sloping Ground: On sloping ground, always measure the depth of the hole from the low side of the hole.

3.1.1.4 Alignment of Poles: Set poles in alignment and plumb except at corners, terminals, angles, junctions, or other points of strain, where they shall be set and raked against the strain, not less than 2 inches for each 10 feet of pole length above grade, nor more than 4 inches for each 10 feet of pole length after conductors are installed at the required tension.

3.1.2 Anchors and Guys: Place anchors in line with the strain and as nearly as possible a distance from the pole equal to the vertical distance from the pole ground line to the point of guy attachment on the pole.

3.1.2.1 Setting Anchors: Set anchors in place with the anchor rod aligned with, and pointing directly at, the guy attachment on the pole with the anchor rod projecting 6 to 9 inches out of the ground to prevent burial of the rod eye.

3.1.2.2 Backfilling Near the Anchors: Backfill, plate, type anchors with tightly tamped granular fill 2 feet immediately above the anchor and then with tightly tamped earth filling the remainder of the hole.

3.1.2.3 Setting Guy Strands: Complete the anchor and guy installation, dead end to dead end, and tighten the guy before wire stringing and sagging is begun on that line section. Provide strain insulators at a point on the guy strand 8 feet (minimum) from the ground and 6 feet (minimum) from the surface of the pole. Effectively ground and bond guys to the system neutral.

3.1.3 Hardware: Install hardware with washer against the wood and with nuts and lock nuts applied wrench tight. Use locknuts on all threaded hardware connections. Locknuts should be M-F style and not the palnut style.

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3.1.4 Grounding: Provide grounding for pole lines conforming to ANSI C2 except that each separate ground electrode shall have a resistance to the solid earth not exceeding 25 ohms. When work in addition to that indicated or specified, is directed in order to obtain the specified ground resistance, the provisions of the Contract covering "changes" shall apply.

3.1.4.1 Ground Rod Connections: Make ground rod connections on pole lines by using a compression connector for all ground wire or wire to rod connections.

3.1.4.2 Other Metal Parts: Ground noncurrent carrying metal parts of equipment or enclosures.

3.1.4.3 Protective Molding: Protect grounding conductors which are run on the surface of wood poles by wood molding or plastic molding of equal mechanical strength extending from the ground line throughout communication spaces.

3.1.5 Conductors: Conductors shall be handled with all care necessary to prevent nicking, kinking, gouging, flattening, or otherwise deforming or weakening the conductor or impairing its conductivity. Remove all damaged sections of conductor and splice the conductor.

3.1.5.1 Splices: Conductor splices, as installed, shall exceed the ultimate rated strength of the conductor and shall be of the type recommended by the conductor manufacturer. No splice shall be permitted within 10 feet of any support.

3.1.5.2 New Conductor Installation: String new conductors to "INITIAL" sag table values recommended by the manufacturer for the conductor type and size of conductor and ruling span indicated.

3.1.5.3 Fittings: Dead end fittings, clamp or compression type, shall conform to the written recommendations of the conductor manufacturer and shall develop the full ultimate strength of the triplex cable assembly.

3.1.5.4 Aluminum Connections: Make aluminum connections to any other material using only splices, connectors, lugs, or fittings designed for that specific purpose. Maintain a copy of the approved manufacturer's directions for such connections at the job site for the use of the inspector.

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3.1.5.5 Messenger Assembly: All messenger cable hardware shall be galvanized steel for attaching messenger cable to the poles or risers and shall develop the full breaking strength of the messenger. Sag to develop the minimum clearance indicated when the installation is complete. Install the CT cable to the messenger with messenger rings, stainless steel cable straps or other non-corrosive metal lashings. Taping and plastic cable bands shall not be used. Cable lashing spacing shall be on a maximum of 15 inches on center.

3.1.6 Risers: Secure conduits on poles by two hole galvanized steel pipe straps spaced no more than as noted and within 3 feet of any outlet or termination. Ground metallic conduits.

3.1.7 Telephone Service: Coordinate with Local Telephone Company regarding relocation of existing telephone line to existing Maintenance Building to new overhead pole line.

3.2 Ground Rod Tests: Do not connect the ground rods until they have been tested for ground resistance value. Use a portable ground testing megger to test each ground or group of grounds. Follow the directions provided by the equipment manufacturer for proper use of the equipment.

3.2.1 Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least three times, demonstrating satisfactory operation each time.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - OVERHEAD ELECTRICAL WORK:

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

4.2 PAYMENT - OVERHEAD ELECTRICAL WORK:

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

END OF SECTION

SPECIFICATIONS

SECTION 16402

EXTERIOR/INTERIOR WIRING SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION:

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

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 basic designation only.

1.2.1 American National Standards Institute, Inc. (ANSI) Publications:

C80.1	Rigid Steel Conduit, Zinc Coated
C80.3	Electrical Metallic Tubing, Zinc Coated
C80.5	Rigid Aluminum Conduit

1.2.2 American Society for Testing and Materials (ASTM) Publications:

B1	Hard-Drawn Copper Wire
B8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
E814	Fire Tests of Through-Penetration Fire Stops

1.2.3 Federal Specifications (FS):

L-P-387	Plastic Sheet, Laminated, Thermosetting (for Design Plates)

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W-C-375	Circuit Breakers, Molded Case, Branch Circuit and Service
W-S-896	Switches, Toggle (Toggle and Lock), Flush Mounted

1.2.4 National Electrical Manufacturers Association (NEMA) Publications:

BU1	Busways
FU1	Low Voltage Cartridge Fuses
ICS1	Industrial Control and Systems
ICS2	Industrial Control Devices, Controllers and Assemblies
ICS4	Terminal Blocks for Industrial Use
ICS6	Enclosures for Industrial Controls and Systems
KS1	Enclosed Switches
MG1	Motors and Generators
RN1	Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
ST20	Dry-Type Transformers for General Applications
TC2	Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)

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TC3	PVC Fittings for Use with Rigid PVC Conduit and Tubing
TC13	Electrical Nonmetallic Tubing (ENT)
TC14	Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings
VE1	Metallic Cable Tray Systems
WD1	Wiring Devices

1.2.5 National Fire Protection Association (NFPA) Publication:

70	National Electrical Code

1.2.6 Underwriters' Laboratories, Inc. (UL) Publications:

1	Flexible Metal Conduit
4	Armored Cable
5	Surface Metal Raceways and Fittings
6	Rigid Metal Conduit
50	Cabinets and Boxes, Electrical
67	Panelboards
83	Thermoplastic-Insulated Wires and Cables
198C	High-Interrupting-Capacity Fuses, Current-Limiting Types

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198E	Class R Fuses
198H	Class T Fuses
360	Liquid-Tight Flexible Steel Conduit
467	Grounding and Bonding Equipment
486A	Wire Connector and Soldering Lugs for Use with Copper Conductors
486B	Wire Connectors for Use with Aluminum Conductors
486C	Splicing Wire Connectors
489	Molded-Case Circuit Breakers and Circuit-Breaker Enclosures
498	Attachment Plugs and Receptacles
506	Specialty Transformers
508	Industrial Control Equipment
510	Insulating Tape
514A	Metallic Outlet Boxes
514B	Fittings for Conduit and Outlet Boxes
514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
719	Nonmetallic-Sheathed Cables

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797	Electrical Metallic Tubing
845	Motor Control Centers
854	Service-Entrance Cables
857	Busways and Associated Fittings
869	Service Equipment
886	Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations
943	Ground-Fault Circuit Interrupters
984	Hermetic Refrigerant Motor-Compressors
1242	Intermediate Metal Conduit
1569	Metal-Clad Cables

1.3 RELATED REQUIREMENTS: Section 16011, "Electrical General Requirements", applies to this Section with additions and modifications specified herein.

1.4 SUBMITTALS: Submit the following:

1.4.1 Manufacturer's Catalog Data:

a. Disconnects

b. Circuit breakers

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1.4.2 Field Test Reports:

a. Grounding system test

1.4.2.1 Format: Submit test results for approval in report form.

1.5 QUALITY ASSURANCE: In each standard referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" has been substituted for "should" wherever it appears. Interpret references in these standards to "authority having jurisdiction," or words of similar meaning, to mean Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: Materials, equipment, and devices shall, as a minimum, meet requirements of UL, where UL standards are established for those items, and requirements of NFPA 70.

2.2 CONDUIT AND FITTINGS:

2.2.1 Rigid Steel Conduit (Zinc-Coated): ANSI C80.1, UL6.

2.2.2 Flexible Metal Conduit: UL 1.

2.2.2.1 Liquid-tight Flexible Metal Conduit, Steel: UL 360.

2.2.3 Fittings for Metal Conduit, and Flexible Metal Conduit: UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B.

2.2.3.1 Fittings for Rigid Metal Conduit: Threaded-type. Split couplings unacceptable.

2.2.4 Fittings for Rigid Nonmetallic Conduit: NEMA TC3.

2.3 SURFACE METAL RACEWAY AND FITTINGS: UL 5, two-piece painted steel, totally enclosed, screw fastened cover type. NEMA 3R rated if used outdoors.

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2.4 OUTLET BOXES AND COVERS: UL 514A, cadmium- or zinc-coated, if ferrous metal. UL 514C, if nonmetallic.

2.4.1 Outlet Boxes in Hazardous Locations: UL 886.

2.5 CABINETS, JUNCTION BOXES, AND PULL BOXES: Volume greater than 100 cubic inches, UL 50, hot dip, zinc-coated, if sheet steel.

2.6 WIRES AND CABLES: Wires and cables shall meet applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to site shall not be used.

2.6.1 Conductors: Shall be stranded. Conductor sizes and ampacities shown are based on copper, unless indicated otherwise.

2.6.1.2 Minimum Conductor Sizes: Minimum size for branch circuits shall be No. 12 AWG; for Class 1 remote-control and signal circuits, No. 14 AWG; and for Class 2 low-energy, remote-control and signal circuits, No. 16 AWG.

2.6.2 Color Coding: Provide for service, feeder, branch, control, and signaling circuit conductors. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutral shall be white with colored (not green) stripe. Color of ungrounded conductors in different voltage systems shall be as follows:

a. 120/240 volt, single phase: red and black.

2.6.3 Insulation: Unless specified or indicated otherwise or required by NFPA 70, power and lighting wires shall be 600-volt, Type THWN, except that grounding wire may be Type TW. Conductors shall conform to UL 83. Where lighting fixtures require 90-degree C conductors, provide only conductors with 90-degree C insulation or better.

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2.6.4 Bonding Conductors: ASTM B1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

2.7 SPLICES AND TERMINATION COMPONENTS: UL 486A and UL 486B, as applicable, for wire connectors and UL 510 for insulating tapes. Connectors for No. 10 AWG and smaller diameter wires shall be insulated, pressure-type in accordance with UL 486A or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.8 DEVICE PLATES: Provide UL listed, one-piece device plates for outlets and fittings to suit the devices installed. For metal outlets and fittings, plates on unfinished walls and on fittings shall be of zinc-coated sheet steel or cast metal having round or beveled edges. For nonmetallic boxes and fittings, other suitable plates may be used. Screws shall be machine-type with countersunk heads in color to match finish of plate. Use of sectional-type device plates will not be permitted. Plates installed in wet locations shall be gasketed and UL listed for "wet locations".

2.9 SWITCHES:

2.9.1 Disconnect Switches: NEMA KS1. Switches serving as motor-disconnect means shall be horsepower rated. Provide heavy duty-type switches where indicated, where switches are rated higher than 240 volts, and for double-throw switches.

Fused switches shall utilize Class R fuse holders and fuses, unless indicated otherwise. Provide switches in NEMA 3R enclosure, per NEMA ICS6.

2.10 RECEPTACLES: UL 498 and NEMA WD1, heavy-duty, specification grade, grounding-type. Ratings and configurations shall be as indicated. Wiring terminals shall be screw-type, side-wired. Connect grounding pole to mounting strap.

2.10.1 Weatherproof Receptacles: Provide in cast metal box with gasketed, weatherproof, cast-metal cover plate and gasketed cap over each receptacle opening. Caps shall be provided with a spring-hinged flap. Receptacle shall be UL listed for use in "wet locations".

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2.10.2 Ground-fault Circuit Interrupter (GFCI) Receptacles: UL 943, 20 ampere duplex type for mounting in standard outlet box. Device shall be capable of detecting current leak of 6 milliamperes or greater and tripping per requirements of UL 943 for Class A GFCI devices.

2.11 Circuit Breakers: FS W-C-375 ambient-compensated thermal magnetic-type with interrupting capacity of 10,000 amperes symmetrical minimum. Breaker terminals shall be UL listed as suitable for type of conductor provided. Provide type suitable for use in indicated existing panelboard.

2.12 FUSES: NEMA FU1. Provide complete set of fuses for each fusible switch. Time-current characteristics curves of fuses serving motors or connected in series with circuit breakers or other circuit protective devices shall be coordinated for proper operation. Fuses shall have voltage rating not less than circuit voltage.

2.12.1 Cartridge Fuses, Current Limiting Type (Class R): UL 198E, Class RK-5 time delay-type. Associated fuseholders shall be Class R only.

2.13 MOTORS: NEMA MG1; Hermetic-type sealed motor compressors shall also comply with UL 984. Provide the size in terms of HP, or kVA, or full-load current, or a combination of these characteristics, and other characteristics, of each motor as indicated or specified. Determine specific motor characteristics to ensure provision of correctly sized starters and overload heaters. Provide motors designed to operate at full capacity with voltage variation of plus or minus 10 percent of motor voltage rating.

2.13.1 Motor Sizes: Provide size for duty to be performed, not exceeding the full-load nameplate current rating when driven equipment is operated at specified capacity under most severe conditions likely to be encountered. When motor size provided differs from size indicated or specified, make adjustments to wiring, disconnect devices, and branch circuit protection to accommodate equipment actually provided.

2.14 TELEPHONE SYSTEM: Provide system of telephone wire-supporting structures, including conduits with pull wires and other accessories for telephone.

2.14.1 Backboards: Exterior grade painted plywood, 3/4-inch thick.

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2.15 GROUNDING AND BONDING EQUIPMENT: UL 467. Ground rods shall be sectional type, copper-clad steel, with minimum diameter of 3/4 inch and minimum length of 10 feet.

2.16 HAZARDOUS LOCATIONS: Electrical materials, equipment, and devices for installation in hazardous locations, as defined by NFPA 70, shall be specifically approved by Underwriters' Laboratories, Inc., or Factory Mutual for particular "Class", "Division", and "Group" of hazardous locations involved. Boundaries and classifications of hazardous locations shall be as indicated.

2.17 NAMEPLATES: FS L-P-387. Provide as specified in Section 16011, "Electrical General Requirements".

PART 3 - EXECUTION

3.1 INSTALLATION: Electrical installations shall conform to requirements of NFPA 70 and to requirements specified herein.

3.1.1 Underground Service: Underground service conductors and associated conduit shall be continuous from service entrance equipment to outdoor power system connection.

3.1.2 Overhead Service: Overhead service conductors shall terminate at exterior service entrance fittings or weatherhead. Overhead service conductors and support bracket for overhead conductors are included in the Section 16302, "Overhead Electrical Work".

3.1.3 Hazardous Locations: Work in hazardous locations, as defined by NFPA 70, shall be performed in strict accordance with NFPA 70 for particular "Class", "Division", and "Group" of hazardous locations involved. Provide conduit and cable seals where required by NFPA 70. Conduit shall have tapered threads.

3.1.4 Service Entrance Identification: Service entrance disconnect devices, switches, or enclosures shall be labeled or identified as such.

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3.1.5 Wiring Methods: Provide insulated conductors installed in conduit, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Provide insulated, green equipment grounding conductor in feeder and branch circuits, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor. Provide insulated, green conductor for grounding conductors installed in conduit or raceways. Minimum conduit size shall be 1/2 inch in diameter for low voltage lighting and power circuits.

3.1.5.1 Service Entrance Conduit, Overhead: Schedule 80 PVC from service connection to service weatherhead outside building.

3.1.5.2 Service Entrance Conduit, Underground: Schedule 80 PVC shall be installed minimum 24 inches below slab or grade.

3.1.5.3 Underground Conduit Other Than Service Entrance: Plastic-coated rigid steel; or PVC, Type EPC-80. Convert nonmetallic conduit, other than PVC Schedule 80, to plastic-coated rigid, steel conduit before rising through floor slab; plastic coating shall extend minimum 6 inches above floor.

3.1.6 Conduit Installation: Unless indicated otherwise, run conduit exposed. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where conduit will be visible after completion of project.

3.1.6.1 Conduit Support: Support conduit by pipe straps, wall brackets or hangers. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Load applied to fasteners shall not exceed one-fourth proof test load. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete joints shall not cut main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet metal screws.

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3.1.6.2 Directional Changes in Conduit Runs: Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of obstructions.

3.1.6.3 Pull Wire: Install pull wires in empty conduits in which wire is to be installed by others. Pull wire shall be plastic having minimum 200-pound tensile strength. Leave minimum 12 inches of slack at each end of pull wire.

3.1.6.4 Telephone and Signal System Conduits: Install in accordance with specified requirements for conduit and with additional requirement that no length of run shall exceed 150 feet for trade sizes 2 inches and smaller and shall not contain more than two 90-degree bends or equivalent. Provide pull or junction boxes where necessary to comply with these requirements. Inside radii of bends in conduits one-inch trade size and larger shall be minimum five times nominal diameter.

3.1.6.5 Locknuts and Bushings: Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits, and provide insulating type where required by NFPA 70. Exterior conduit connections shall be made with waterproof hubs.

3.1.6.6 Stub-ups: Provide conduits stubbed up for connection to free-standing equipment with adjustable top or coupling threaded inside for plugs. Extend conductors to equipment in rigid steel conduit, except that flexible metal conduit may be used 6 inches above floor. Where no equipment connections are made, install screwdriver-operated threaded flush plugs in conduit end.

3.1.6.7 Flexible Connections: Provide flexible connections of short length, 6-foot maximum, for equipment subject to vibration, noise transmission, or movement; and for motors. Provide liquid-tight flexible conduit in wet locations. Provide separate ground conductor across flexible connections.

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3.1.7 Boxes, Outlets, and Supports: Provide boxes in wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices. Boxes for metallic raceways shall be cast-metal, hub-type when located in wet locations, when surface mounted on outside of exterior surfaces, when installed exposed up to 7 feet above interior floors and walkways, or when installed in hazardous areas. Boxes in other locations shall be sheet steel; nonmetallic boxes may be used with nonmetallic conduit system. Each box shall have volume required by NFPA 70 for number of conductors enclosed in box. Provide gaskets for cast-metal boxes installed in wet locations and boxes installed outside of exterior surfaces. Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel. In open overhead spaces, cast boxes threaded to raceways need not be separately supported except where used for fixture support; support sheet metal boxes directly from building structure or by bar hangers. Where bar hangers are used, attach bar to raceways on opposite sides of box, and support raceway with approved-type fastener maximum 24 inches from box. When penetrating reinforced concrete members, avoid cutting reinforcing steel.

3.1.7.1 Boxes: Boxes for use with raceway systems shall be minimum 1-1/2 inches deep, except where shallower boxes required by structural conditions are approved. Boxes for other than lighting fixture outlets shall be minimum 4 inches square, except that 4-by-2-inch boxes may be used where only one raceway enters outlet.

3.1.7.2 Pull Boxes: Construct of at least minimum size required by NFPA 70 of code-gauge galvanized sheet steel, compatible with nonmetallic raceway systems, except where cast-metal boxes are required in locations specified herein. Furnish boxes with screw-fastened covers. Where several feeders pass through common pull box, tag feeders to indicate clearly electrical characteristics, circuit number, and panel designation.

3.1.8 Mounting Heights: Mount panelboards, circuit breakers, and disconnecting switches so height of operating handle at its highest position is maximum 78 inches above floor. Mount receptacles 48 inches above finished grade and other devices as indicated. Measure mounting heights of wiring devices and outlets to center of device or outlet.

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3.1.9 Conductor Identification: Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, color coding shall be by factory-applied, color-impregnated insulation. For conductors No. 4 AWG and larger diameter, color coding shall be by plastic-coated, self-sticking markers; colored nylon cable ties and plates; or heat shrink-type sleeves. Identify control circuit terminations.

3.1.10 Splices: Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors No. 8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.

3.1.10.1 Splices of Aluminum Conductors: Make with solderless circumferential compression-type, aluminum-bodied connectors UL listed for AL/CU. Remove surface oxides from aluminum conductors by wire brushing and immediately apply oxide-inhibiting joint compound and insert in connector. After joint is made, wipe away excess joint compound, and insulate splice.

3.1.11 Covers and Device Plates: Install with edges in continuous contact with finished wall surfaces without use of mats or similar devices. Plaster fillings are not permitted. Plates shall be installed with alignment tolerance of 1/16 inch. Use of sectional-type device plates are not permitted. Plates installed in wet locations shall be gasketed.

3.1.12 Grounding and Bonding: In accordance with NFPA 70. Ground-exposed, noncurrent-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in metallic and nonmetallic raceways, grounding conductor of nonmetallic sheathed cables, and neutral conductor of wiring systems. Make connection to water pipe by suitable ground clamp or lug connection to plugged tee. If flanged pipes are encountered, make connection with lug bolted to street side of flanged connection. Supplement metallic water service grounding system with additional made electrode in compliance with NFPA 70. Make ground connection to driven ground rods on exterior of building. Where ground fault protection is employed, ensure that connection of ground and neutral does not interfere with correct operation of fault protection.

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3.1.12.1 Grounding Conductor: Provide insulated, green equipment grounding conductor in feeder and branch circuits, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor. Provide insulated, green conductor for grounding conductors installed in conduit or raceways.

3.1.12.2 Resistance: Maximum resistance-to-ground of grounding system shall not exceed 25 ohms under dry conditions. Where resistance obtained exceeds 25 ohms, contact Engineer for further instructions.

3.1.13 Repair of Existing Work: Repair of existing work, demolition, and modification of existing electrical distribution systems shall be performed as follows:

3.1.13.1 Workmanship: Lay out work in advance. Exercise care where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary for proper installation, support, or anchorage of conduit, raceways, or other electrical work. Repair damage to buildings, piping, and equipment using skilled craftsmen of trades involved.

3.1.13.2 Existing Concealed Wiring to be Removed: Existing concealed wiring to be removed shall be disconnected from its source. Remove conductors; cut conduit flush with floor, underside of floor, and through walls; and seal openings.

3.1.13.3 Removal of Existing Electrical Distribution System: Removal of existing electrical distribution system equipment shall include equipment's associated wiring, including conductors, cables, exposed conduit, surface metal raceways, boxes, fittings, etc., back to equipment's source as indicated.

3.1.13.4 Continuation of Service: Maintain continuity of existing circuits of equipment to remain. Existing circuits of equipment shall remain energized. Circuits which are to remain but were disturbed during demolition shall have circuits wiring and power restored back to original condition.

3.2 FIELD QUALITY CONTROL: Furnish test equipment and personnel and submit written copies of test results. Give Engineer 5 working days notice prior to test.

3.2.1 Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least five times, demonstrating satisfactory operation each time.

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3.2.2 Test on 600-volt Wiring: Test 600-volt wiring to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 500 volts to provide direct reading of resistance. Minimum resistance shall be 250,000 ohms.

3.2.3 Grounding System Test: Test grounding system to ensure continuity and resistance to ground is not excessive. Test each ground rod for resistance to ground before making connections to rod; tie grounding system together and test for resistance to ground. Make resistance measurements in dry weather, not earlier than 48 hours after rainfall. Submit written results of each test to Engineer, and indicate location of rods as well as resistance and soil conditions at time measurements were made.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - INTERIOR WIRING SYSTEMS:

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

4.2 PAYMENT - INTERIOR WIRING SYSTEMS:

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

END OF SECTION

SPECIFICATIONS

SECTION 16450

GROUNDING

PART 1 - GENERAL

1.1 DESCRIPTION: Under this Section, the Contractor shall furnish all labor, materials and equipment for Grounding and Bonding of electrical installations as shown on the Plans, as specified and/or directed.

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 basic designation only.

1.2.1 National Fire Protection Association (NFPA) Publication:

70	National Electrical Code (NEC)

1.2.2 Underwriters' Laboratories, Inc. (UL) Publications:

83	Thermoplastic-Insulated Wires and Cables
44	Rubber-Insulated Wires and Cables
467	Grounding and Bonding Equipment

1.3 RELATED SECTIONS:

1.3.1 Section 16011, Electrical General Requirements.

1.3.2 Section 16670, Lightning Protection System.

1.4 SUBMITTALS:

1.4.1 Submit the following:

1.4.2 Submit test reports in accordance with Section 16011, "Electrical General Requirements".

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1.4.2.1 Certified test reports of ground resistance.

1.4.2.2 Certifications: Two weeks prior to final inspection, deliver to the Engineer four copies of the certification that the material and installation is in accordance with the drawings and specifications and has been properly installed.

PART 2 - PRODUCTS

2.1 GROUNDING WIRES:

2.1.1 General Purpose: UL and NEC approved types, copper, with TW, THW, XHHW or dual rated THHN-THWN insulation color identified green.

2.1.2 Isolated Power System: Type XHHW insulation with a dielectric constant of 3.5 or less.

2.1.3 Size wire not less than what is shown and not less than required by the NEC.

2.2 GROUND RODS:

2.2.1 Copper clad steel, 3/4-inch diameter by 10 feet long.

PART 3 - EXECUTION

3.1 INSTALLATION:

3.1.1 Ground as shown and as hereinafter specified in accordance with the NEC.

3.1.2 System Grounding:

3.1.2.1 Secondary service neutrals ground at the supply side of the secondary disconnecting means and at the related transformers.

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3.1.2.2 Separately derived systems (transformers downstream from the service entrance) ground the secondary neutral.

3.1.2.3 Isolation transformers and isolated power systems shall not be system grounded.

3.1.3 Equipment Grounding:

3.1.3.1 Metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, and other conductive items in close proximity with electrical circuits shall be grounded for personnel safety and to provide a low impedance path for possible ground fault currents.

3.2 PRIMARY EQUIPMENT AND CIRCUITS:

3.2.1 Switchgear: Provide a bare grounding electrode conductor from the switchgear ground bus to a grounding electrode system, metal underground water pipe or driven ground rods for the grounding electrode.

3.2.2 Duct Banks and Manholes:

3.2.2.1 Provide a bare equipment grounding conductor in each duct bank containing medium or high voltage cables. Connect the grounding conductors to the switchgear ground bus, to all manhole hardware, to the cable shielding of medium or high voltage cable splices and terminations, and equipment enclosures.

3.2.2.2 Provide a grounding conductor having at least 50 percent ampacity of the largest phase conductor in the duct bank.

3.2.2.3 Connect the equipment grounding conductor to the ground rod.

3.2.3 Outdoor Fences: Connect outdoor fences around electrical equipment to the grounding electrode system.

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3.2.4 Metallic Conduit: Metallic conduits which terminate without mechanical connection to a housing of electrical equipment by means of locknut and bushings or adapters, provided with grounding bushings. Connect bushings with a bare grounding conductor to the equipment ground bus.

3.2.5 Lightning Arresters: Connect lightning arrester grounds to the equipment ground bus, or ground rods as applicable.

3.3 SECONDARY EQUIPMENT AND CIRCUITS:

3.3.1 Main Bonding Jumper: Connect the secondary service neutral to the ground bus in the service equipment.

3.3.2 Water Pipe and Supplemental Electrode:

3.3.2.1 Provide a ground conductor connection between the service equipment ground bus and the metallic water pipe system. Jumper insulating joints in the water pipe.

3.3.2.2 Provide a supplemental ground electrode and bond to the water pipe ground, or connect to the service equipment ground bus.

3.3.3 Service Disconnect (Separate Individual Enclosure): Provide a ground bar bolted to the enclosure with lugs for connecting the various grounding conductors.

3.3.4 Switchgear, Switchboards and Unit Substations:

3.3.4.1 Connect the various feeder green grounding conductors to the ground bus in the enclosure with suitable pressure connectors.

3.3.4.2 Connect the grounding electrode conductor to the ground bus.

3.3.4.3 Connect the neutral to the ground bus (main bonding jumper).

3.3.4.4 Connect metallic conduits, which terminate without mechanical connection to the housing, by grounding bushings and ground wire to the ground bus.

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3.3.5 Conduit Systems:

3.3.5.1 Ground all metallic conduit systems.

3.3.5.2 Non-metallic conduit systems shall contain a grounding conductor.

3.3.5.3 Conduit provided for mechanical protection containing only a grounding conductor, bond to that conductor at the entrance and exit from the conduit.

3.3.6 Feeders and Branch Circuits: Install green grounding conductors with feeders and branch circuits as follows:

a. Feeders
b. Branch Circuits
c. Receptacle Outlets
d. Directly Connected Equipment, Appliances and Devices
e. Motors and Motor Controllers
f. Fixed Equipment and Appurtenances
g. Items of equipment where the final connection is made with flexible metal conduit shall have a grounding wire.
h. Additional locations and systems as shown

3.3.7 Boxes, Cabinets, Enclosures and Panelboards:

3.3.7.1 Bond the grounding wires to each pull box, junction box, outlet box, cabinets, and other enclosures through which the ground wires pass.

3.3.7.2 Provide lugs in each box and enclosure for ground wire termination.

3.3.7.3 Provide ground bars in panelboards, bolted to the housing, with sufficient lugs for terminating the ground wires.

3.3.8 Motors and Starters:

3.3.8.1 Provide lugs in motor terminal box and starter housing for ground wire termination.

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3.3.8.2 Make ground wire connections to ground bus in motor control centers.

3.3.9 Receptacles are not approved for grounding through their mounting screws. Ground with a ground wire from green ground terminal on the receptacle to the outlet box ground screw.

3.3.10 Ground lighting fixtures to the green grounding conductor of the wiring system. During renovation, provide the green ground if it is not part of the system, or ground the fixtures through the conduit systems per means acceptable under the NEC. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.

3.3.11 Fixed electrical appliances and equipment shall have a ground lug installed for termination of the green ground conductor.

3.4 CONDUCTIVE PIPING:

3.4.1 Bond all conductive piping systems in the building to the electrical system ground. Bonding connections shall be made as close as practical to the water pipe ground or service equipment ground bus.

3.5 GROUND RESISTANCE:

3.5.1 Grounding system ground resistance must comply with NEC.

3.5.2 Services at power company interface points shall comply with the power company ground resistance requirements.

3.5.3 Make necessary modifications to the ground electrodes for compliance that is needed without additional cost to the Owner, including the provisions of a multi-rod system.

3.6 GROUND ROD INSTALLATION:

3.6.1 Drive each rod vertically in the earth for not less than ten feet in depth.

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GROUNDING

3.6.2 Where permanently concealed ground connections are required, make the connections by the exothermic process to form solid metal joints. Make accessible ground connections with mechanical pressure type ground connectors.

3.6.3 Where rock prevents the driving of vertical ground rods, install grounding electrodes in horizontal trenches to achieve the specified resistance.

3.7 LIGHTNING PROTECTION BOND:

3.7.1 Bond the lightning protection system grounding electrode to the electrical grounding system. Electrode spacing between the two systems shall comply with NEC limitations.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - GROUNDING:

4.1.1 The quantity of Grounding for which payment will be made will include all that equipment, accessories, appurtenances or other work as specified herein and required for a complete operating control system.

4.2 PAYMENT - GROUNDING:

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

END OF SECTION