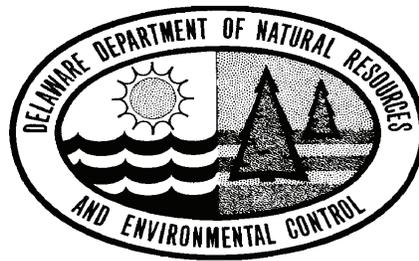


STATE OF DELAWARE

DEPARTMENT OF NATURAL RESOURCES  
AND ENVIRONMENTAL CONTROL

DIVISION OF PARKS AND RECREATION



CAPE HENLOPEN STATE PARK  
SANITARY SEWER REHABILITATION – SEWER LINING  
CONTRACT NO. 2014-CH-100  
March 7, 2014

PARKS PROJECT NO. CH-35A

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**CAPE HENLOPEN STATE PARK**  
**SANITARY SEWER REHABILITATION – SEWER LINING**

**ADVERTISEMENT**

**PROJECT:** Rehabilitation of select sanitary sewer facilities within the Cape Henlopen State Park by trenchless methods. The project generally comprises the installation of cured-in-place main line sewer and lateral piping and the installation of lateral cleanouts.

**OWNER:**

State of Delaware  
Department of Natural Resources and  
Environment Control  
Division of Parks and Recreation  
Office of Design and Development  
89 Kings Highway (Auditorium)  
Dover, DE 19901  
ATTN: Cindy Todd  
Phone: 302-739-9210

**ENGINEER & ISSUING OFFICE:**

URS Corporation  
4051 Ogletown Road  
Sabre Building, Suite 300  
Newark, DE 19713  
Phone: 302-781-5900

Sealed bids for the Project must be received by the Office of Design and Development by 3:00 PM local time on April 28, 2014. All bids must be marked “ATTN: CINDY TODD – Contract 2014-CH-100 – BID” on the outside of the sealed bid package. The bids will then be publicly opened and read.

A pre-bid meeting will be held on April 1, 2014 at 10:00 AM at the Park Office at Cape Henlopen State Park (15099 Cape Henlopen Drive, Lewes, DE 19958). Attendance at this meeting is NOT mandatory for all prospective bidders and will NOT be a pre-requisite for submitting a bid.

Prospective bidders may obtain a CD containing electronic copies of bidding documents upon payment of \$25.00 for each set at the above owner’s address. Checks are to be made payable to the Division of Parks and Recreation. Each bid must be accompanied by a bid security in the form of a certified check or bid bond in the amount of ten percent (10%) of the bid total and made payable to the Department of Natural Resources and Environmental Control.

A copy of the bidding documents can be reviewed at the Delaware Contractors Association, 527 Stanton Christiana Road, Newark, Delaware 19713.

This project is being funded by the Clean Water State Revolving Fund loan funded from the State of Delaware’s Department of Natural Resources and Environmental Control. Bidder must comply with the following provisions that are included in the contract (see program requirements in SECTION 00650):

1. The President’s Executive Order No. 11246 which prohibits discrimination in employment regarding race, creed, color, sex or national origin.
2. The Delaware State Revolving Fund program’s Disadvantaged Business Enterprise (DBE) requirements
3. The requirements of the DBE program regarding the “Good Faith Efforts” necessary to be deemed a responsive and responsible bidder, The Federal Register Part 40 CFR 33.301 requires these Good Faith Efforts in procurement actions to assure that DBEs are made aware of procurement opportunities in construction, equipment, services, and supplies under EPA financial assistant agreements.
  - a. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities by placing qualified DBEs on solicitation lists whenever they are potential sources.
  - b. Establish deliver schedules, where the requirement permits to encourage participation by DBEs.
  - c. Divide total requirements, when economically feasible, into small tasks or quantities, to permit maximum participation of DBEs.

- d. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.  
Use the services of the DelDOT, the United States Small Business (SBA) and the Minority Business Development Agency (MDBA) of the U.S. Department of Commerce.
  - e. Require the prime contractor, if subcontracts are to be let, to take steps a-d.
4. Delaware Prevailing Wage Regulations and Davis-Bacon Acts Provisions and Procedures.

The Office of Design and Development reserves the right, at its option, to waive any informalities, irregularities, defects, errors or omissions in any or all bids and to reject any or all bids.

**CAPE HENLOPEN STATE PARK  
SANITARY SEWER REHABILITATION – SEWER LINING  
CONTRACT NO. 2014-CH-100**

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APPENDICES

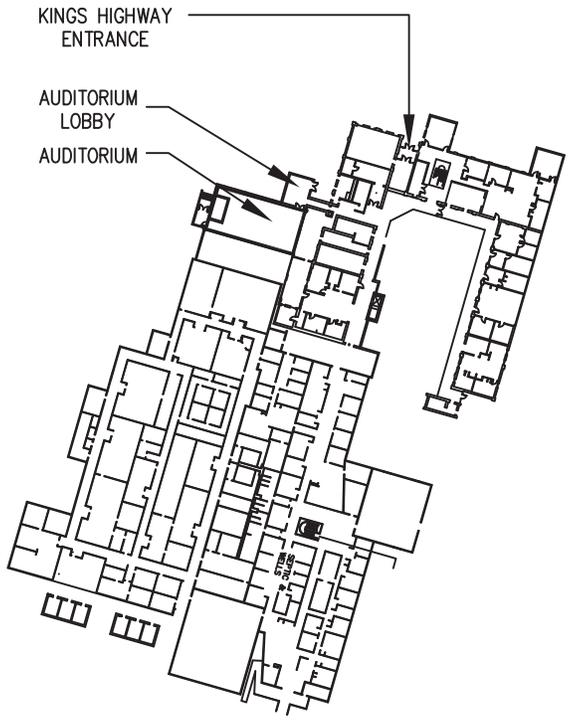
Appendix A – Drawing Details

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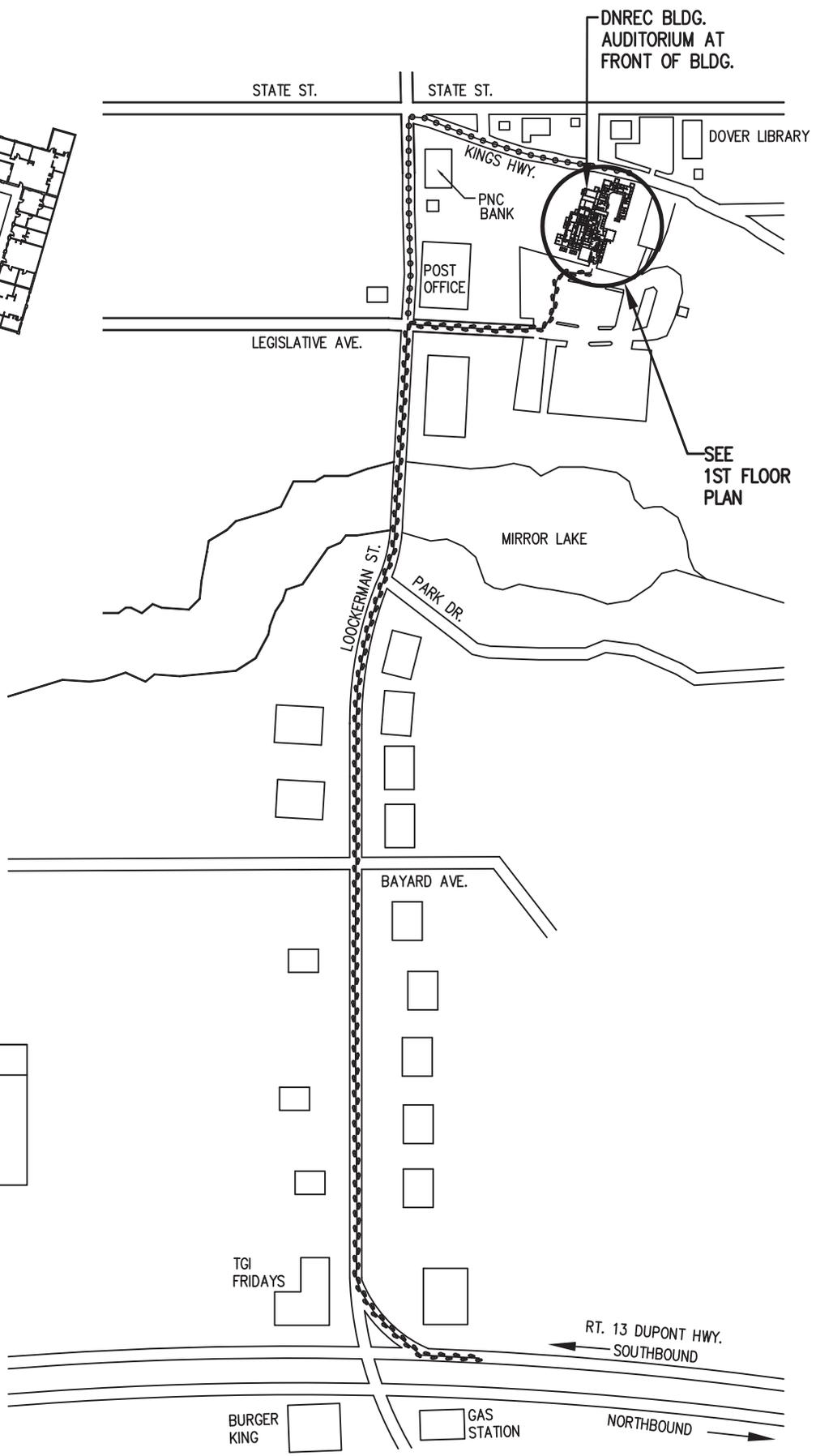
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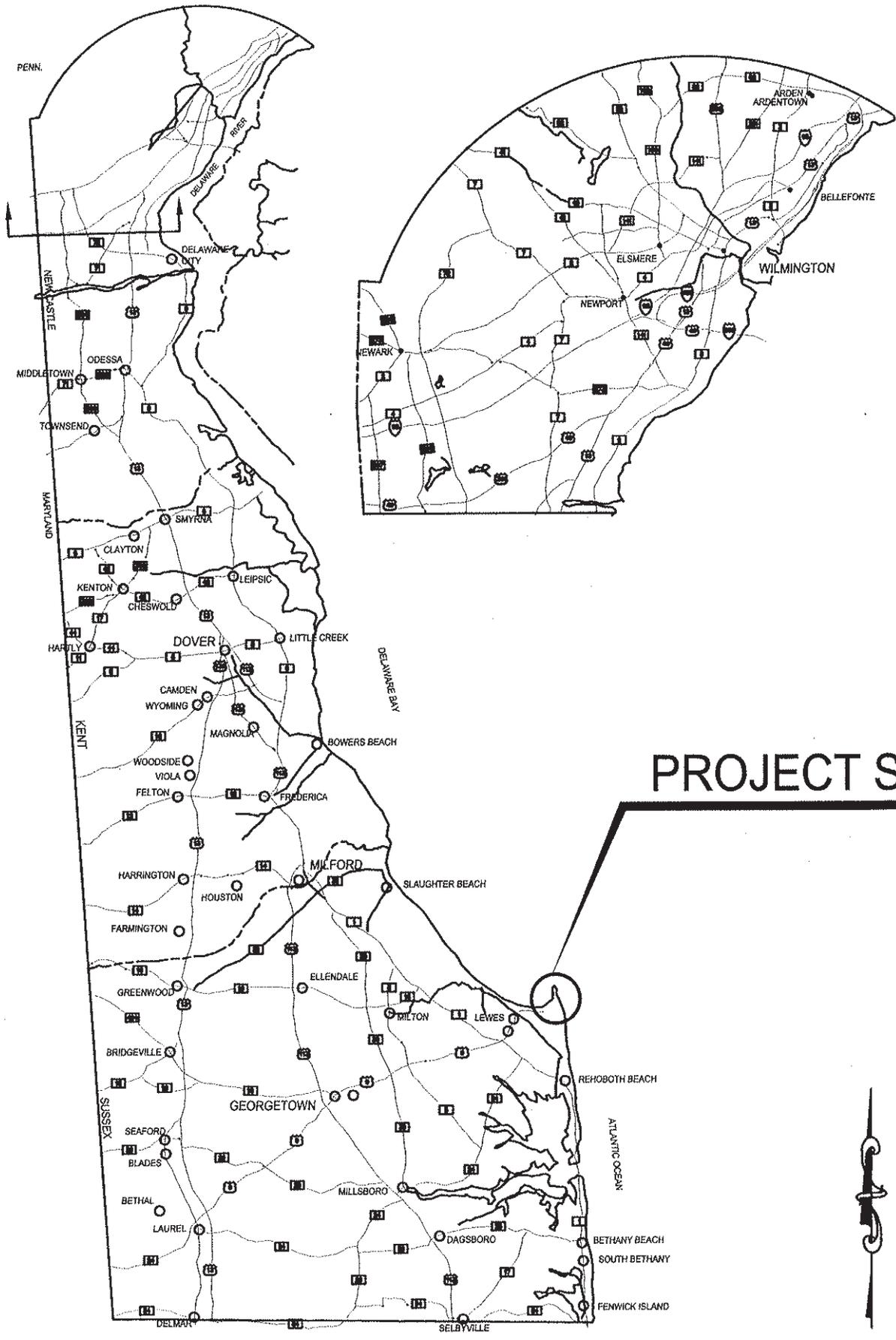
1ST FLOOR PLAN



LEGEND	
	ROUTE TO DNREC PARKING LOT FROM RT. 13 DUPONT HWY.
	ALTERNATE ROUTE TO STREET PARKING ( 2 HOUR LIMIT )

DNREC BUILDING (RICHARDSON & ROBBINS BUILDING) LOCATION MAP

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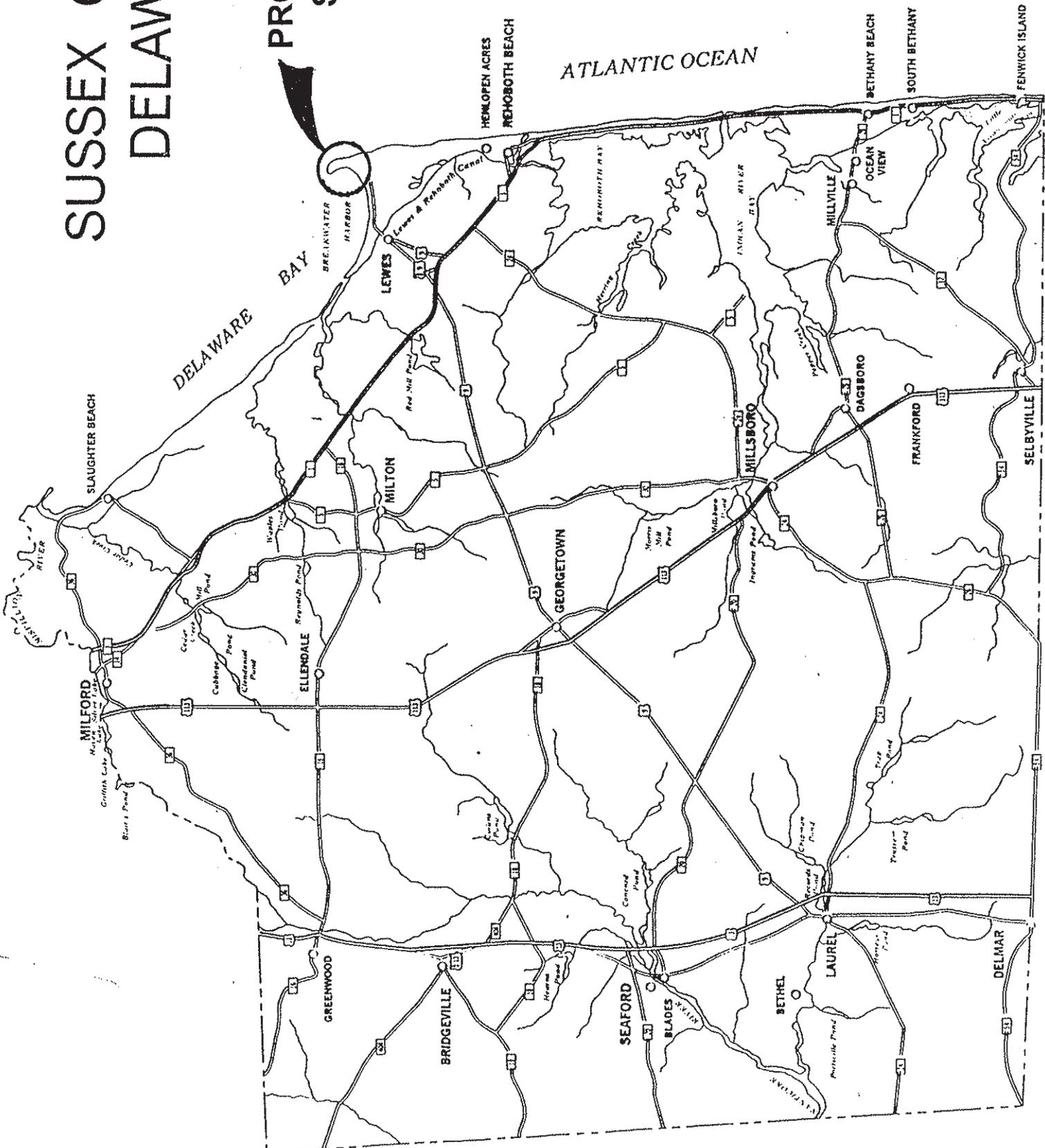
**PROJECT SITE**

**STATE OF DELAWARE**



# SUSSEX COUNTY DELAWARE

## PROJECT SITE

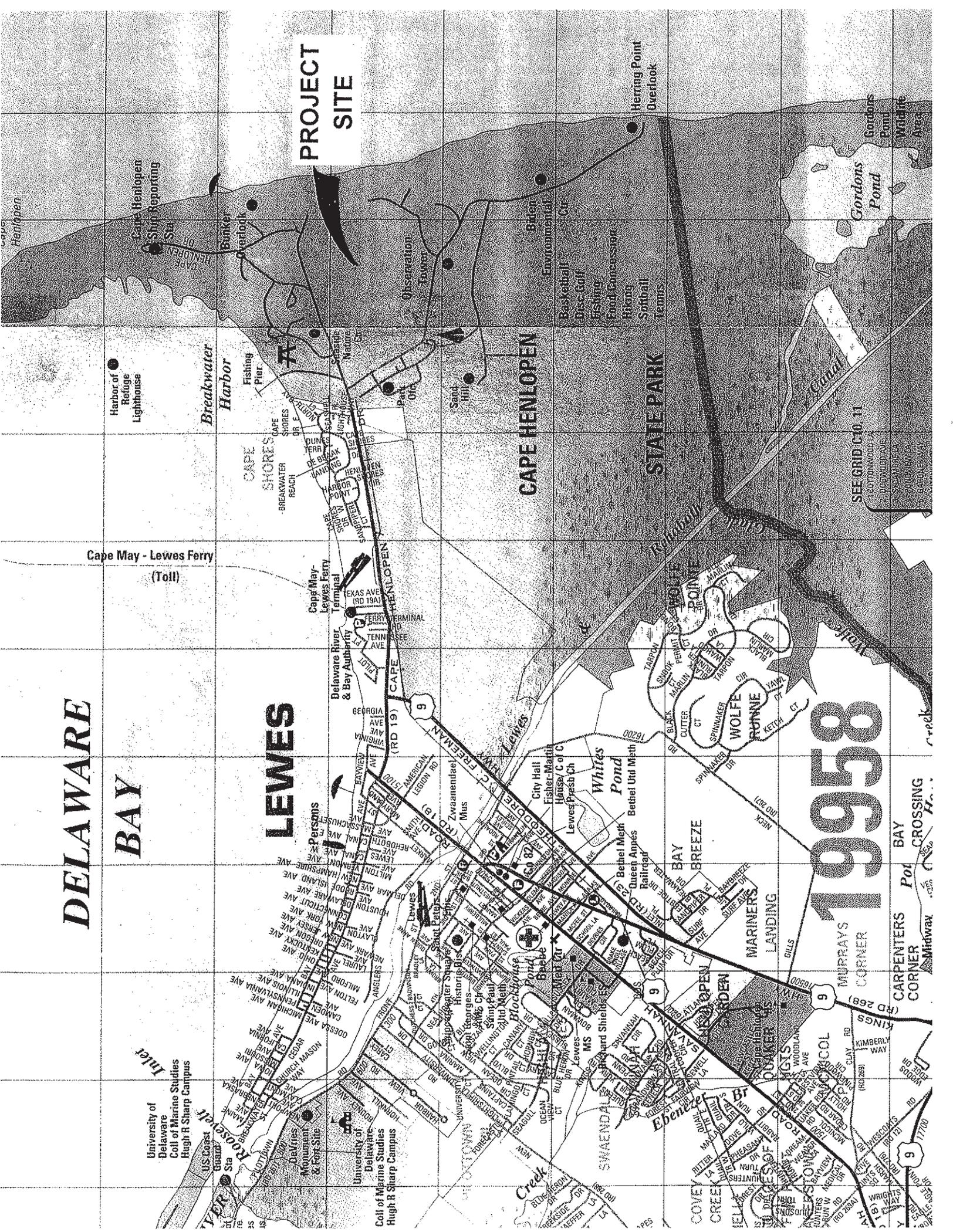


# DELAWARE BAY

# LEWES

# PROJECT SITE

# 19958



Cape Henlopen  
Ship Reporting  
Station

Harbor of  
Refuge  
Lighthouse

Breakwater  
Harbor

CAPE HENLOPEN

STATE PARK

Gordons  
Pond

Wildlife  
Area

Herring Point  
Overlook

Cape May - Lewes Ferry  
(Toll)

Cape May -  
Lewes Ferry  
Terminal

Delaware River  
& Bay Authority  
Terminal

Whites  
Pond

BAY  
BREEZE

MARINERS  
LANDING

University of  
Delaware  
College of Marine Studies  
Hugh R Sharp Campus

University of  
Delaware  
College of Marine Studies  
Hugh R Sharp Campus

WIGGS  
SCHOOL

BAY  
CROSSING

CARPENTERS  
CORNER

WIGGS  
SCHOOL

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**Bid Opening Date: 4/28/2014**

## SECTION 00010 - INVITATION TO BID

The Department of Natural Resources and Environmental Control, Division of Parks and Recreation, Office of Design and Development, will receive sealed bids in the Auditorium, DNREC Building, 89 Kings Highway, Dover, Delaware 19901, until 3:00 p.m., April 28, 2014, at which time they will be publicly opened for the following project: Sanitary Sewer Rehabilitation – Sewer Lining, Cape Henlopen State Park, Contract No. 2014-CH-100.

This project includes the cleaning and televising of sewer and lateral pipes and the installation of cured-in-place main line and lateral pipe liners and associated work.

A pre-bid meeting will be held at 10:00 a.m., April 1, 2014 at the Park Office at Cape Henlopen State Park (15099 Cape Henlopen Drive, Lewes, DE 19958). Attendance at this meeting is NOT mandatory for all prospective bidders and NOT a pre-requisite for submitting a bid.

Proposals shall be placed in a sealed envelope clearly marked BID ENCLOSED, Contract No. 2014-CH-100. and addressed to:

Dept. of Natural Resources & Environmental Control  
Division of Parks and Recreation  
Office of Design and Development (Auditorium)  
89 Kings Highway    Dover, De 19901  
Attn: Cindy Todd    Phone No. 302-739-9231

Prospective bidders may obtain a CD containing electronic copies of bidding documents upon payment of \$25.00 for each set at the above address. Checks are to be made payable to the Division of Parks and Recreation. This payment is non-refundable and the documents need not be returned.

Each bid must be accompanied by a bid guarantee equivalent to ten percent (10%) of the amount of the base bid and all add alternates. The bid guarantee may be a certified check or a bid bond secured by a surety authorized to do business in Delaware. The bid guarantee shall be made payable to the Department of Natural Resources and Environmental Control.

A copy of the bidding documents can be reviewed at the Delaware Contractors Association, 527 Stanton Christiana Road, Newark, Delaware 19713.

The Department of Natural Resources and Environmental Control, Division of Parks and Recreation, Office of Design and Development reserves the right to waive irregularities and reject any or all bids, and to waive any informalities therein. The Department also reserves the right to extend the time and place for bid opening from that described in this advertisement, with not less than 2 calendar days notice by certified mail, facsimile transmission or other verifiable electronic means to those bidders who have obtained copies of the plans and specifications. An Equal Opportunity Employer.

Collin P. O'Mara, Secretary

END OF SECTION 00010 - INVITATION TO BID

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**SECTION 00100 - INSTRUCTIONS TO BIDDERS****TABLE OF ARTICLES**

1. GENERAL
2. BIDDER'S REPRESENTATIONS
3. BIDDING DOCUMENTS
4. BIDDING PROCEDURES
5. CONSIDERATION OF BIDS
6. POST-BID INFORMATION
7. PERFORMANCE BOND AND PAYMENT BOND
8. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

**ARTICLE 1: GENERAL**

## 1.1 DEFINITIONS

1.1.1 Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

1.2 STATE: The State of Delaware.

1.3 AGENCY (OWNER): Contracting State Agency as noted on cover sheet.

1.4 DESIGNATED OFFICIAL: The agent authorized to act for the Agency.

1.5 BIDDING DOCUMENTS: Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement for Bid, Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the Bid Form (including the Non-collusion Statement), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

1.6 CONTRACT DOCUMENTS: The Contract Documents consist of the Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the form of agreement between the Owner and the Contractor, Drawings (if any), Specifications (Project Manual), and all Addenda.

1.7 AGREEMENT: The form of the Agreement shall be AIA Document A101, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a STIPULATED SUM. In the case of conflict between the instructions contained therein and the General Requirements herein, these General Requirements shall prevail.

1.8 GENERAL REQUIREMENTS (or CONDITIONS): General Requirements (or conditions) are instructions pertaining to the Bidding Documents and to contracts in general. They contain, in summary, requirements of laws of the State; policies of the Agency and instructions to bidders.

1.9 SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the bidding documents and to the contract under consideration and are supplemental to the General Requirements. Should the Special Provisions conflict with the General Requirements, the Special Provisions shall prevail.

- 1.10 ADDENDA: Written or graphic instruments issued by the Owner/Architect prior to the Bid opening which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.
- 1.11 BIDDER OR VENDOR: A person or entity who formally submits a Bid for the material or Work contemplated, acting directly or through a duly authorized representative who meets the requirements set forth in the Bidding Documents.
- 1.12 SUB-BIDDER: A person or entity who submits a Bid to a Bidder for materials or labor, or both for a portion of the Work.
- 1.13 BID: A complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.
- 1.14 BASE BID: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids (if any are required to be stated in the bid).
- 1.15 ALTERNATE BID (or ALTERNATE): An amount stated in the Bid, where applicable, to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.
- 1.16 UNIT PRICE: An amount stated in the Bid, where applicable, as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.
- 1.17 SURETY: The corporate body which is bound with and for the Contract, or which is liable, and which engages to be responsible for the Contractor's payments of all debts pertaining to and for his acceptable performance of the Work for which he has contracted.
- 1.18 BIDDER'S DEPOSIT: The security designated in the Bid to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Agency if the Work to be performed or the material or equipment to be furnished is awarded to him.
- 1.19 CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.
- 1.20 CONTRACTOR: Any individual, firm or corporation with whom a contract is made by the Agency.
- 1.21 SUBCONTRACTOR: An individual, partnership or corporation which has a direct contract with a contractor to furnish labor and materials at the job site, or to perform construction labor and furnish material in connection with such labor at the job site.
- 1.22 CONTRACT BOND: The approved form of security furnished by the Contractor and his surety as a guaranty of good faith on the part of the Contractor to execute the Work in accordance with the terms of the Contract.

## **ARTICLE 2: BIDDER'S REPRESENTATIONS**

### **2.1 PRE-BID MEETING**

- 2.1.1 A Pre-bid Meeting for this Project will be held at the time and place designated. Attendance at this meeting is a pre-requisite for submitting a Bid, unless this requirement is specifically waived elsewhere in the Bid Documents.

2.2 By submitting a Bid, the Bidder represents that:

- 2.2.1 The Bidder has read and understands the Bidding Documents and that the Bid is made in accordance therewith.
- 2.2.2 The Bidder has visited the site, become familiar with existing conditions under which the Work is to be performed, and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.
- 2.2.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

2.3 JOINT VENTURE REQUIREMENTS

- 2.3.1 For Public Works Contracts, each Joint Venturer shall be qualified and capable to complete the Work with their own forces.
- 2.3.2 Included with the Bid submission, and as a requirement to bid, a copy of the executed Joint Venture Agreement shall be submitted and signed by all Joint Venturers involved.
- 2.3.3 All required Bid Bonds, Performance Bonds, Material and Labor Payment Bonds must be executed by both Joint Venturers and be placed in both of their names.
- 2.3.4 All required insurance certificates shall name both Joint Venturers.
- 2.3.5 Both Joint Venturers shall sign the Bid Form and shall submit a valid Delaware Business License Number with their Bid or shall state that the process of application for a Delaware Business License has been initiated.
- 2.3.6 Both Joint Venturers shall include their Federal E.I. Number with the Bid.
- 2.3.7 In the event of a mandatory Pre-bid Meeting, each Joint Venturer shall have a representative in attendance.
- 2.3.8 Due to exceptional circumstances and for good cause shown, one or more of these provisions may be waived at the discretion of the State.

2.4 ASSIGNMENT OF ANTITRUST CLAIMS

- 2.4.1 As consideration for the award and execution by the Owner of this Contract, the Contractor hereby grants, conveys, sells, assigns and transfers to the State of Delaware all of its right, title and interests in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the Owner pursuant to this Contract.

**ARTICLE 3: BIDDING DOCUMENTS**

3.1 COPIES OF BID DOCUMENTS

- 3.1.1 Prospective Bidders may obtain complete sets of the Bidding Documents at the Department of Natural Resources & Environmental Control, Division of Parks & Recreation, Office of Design and Development, 89 Kings Highway, Dover, Delaware 19901. The cost for these documents is listed in the Invitation to Bid. This payment is non-refundable and the documents need not be returned.

- 3.1.2 Bidders shall use complete sets of Bidding Documents for preparation of Bids. Neither the issuing Agency nor the Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 3.1.3 Any errors, inconsistencies or omissions discovered shall be reported to the Architect immediately.
- 3.1.4 The Agency and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

### 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

- 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall report any errors, inconsistencies, or ambiguities discovered to the Architect.
- 3.2.2 Bidders or Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Owner at least seven (7) days prior to the date for receipt of Bids. Interpretations, corrections and changes to the Bidding Documents will be made by written Addendum. Interpretations, corrections, or changes to the Bidding Documents made in any other manner shall not be binding.
- 3.2.3 The apparent silence of the Specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of Specification compliance will be the responsibility of the Bidder.
- 3.2.4 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all permits, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.
- 3.2.5 The Owner will bear the costs for all impact and user fees associated with the Project.
- 3.2.6 Quantities used by the Bidder to compute their Bid amount shall be the Quantities indicated on the Bid Form. Quantities indicated on the Drawings and in the Tables in the Project Manual are provided for informational purposes and may, in some instances due to rounding or for contingency purposes, vary from those indicated on the Bid Form.

### 3.3 SUBSTITUTIONS

- 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certifies that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Bidder's responsibility to assure that the proposed substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

- 3.3.2 Requests for substitutions shall be made in writing to, and received by, the Owner before 4:30 p.m., at least ten (10) days prior to the date of the Bid Opening. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due to the substitution, and any other information necessary for an evaluation. (Refer to Section 01600 for additional requirements) The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval shall be final. The Architect is to notify Owner prior to any approvals.
- 3.3.3 If the Architect approves a substitution prior to the receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding.
- 3.3.4 The Architect shall have no obligation to consider any substitutions after the time specified in 3.3.2 of this Section.

#### 3.4 ADDENDA

- 3.4.1 Addenda will be sent by mail, fax, or other verifiable electronic means to all who are known by the Architect to have received a complete set of the Bidding Documents.
- 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.
- 3.4.3 No Addenda will be issued later than 4 days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which extends the time or changes the location for the opening of Bids.
- 3.4.4 Each Bidder shall ascertain prior to submitting his Bid that they have received all Addenda issued, and shall acknowledge their receipt in their Bid in the appropriate space. Not acknowledging issued Addenda could be grounds for determining a bid to be non-responsive.

### ARTICLE 4: BIDDING PROCEDURES

#### 4.1 PREPARATION OF BIDS

- 4.1.1 Submit the bids on the Bid Forms included with the Bidding Documents.
- 4.1.2 Submit the original Bid Form for each bid. Bid Forms may be removed from the Project Manual for this purpose.
- 4.1.3 Execute all blanks on the Bid Form in a non-erasable medium (typewriter or manually in ink).
- 4.1.4 Where so indicated by the makeup of the Bid Form, express sums in both words and figures; in case of discrepancy between the two, the written amount shall govern.
- 4.1.5 Interlineations, alterations or erasures must be initialed by the signer of the Bid.
- 4.1.6 BID ALL REQUESTED ALTERNATES AND UNIT PRICES, IF ANY. If there is no change in the Base Bid for an Alternate, enter "No Change". The Contractor is responsible for verifying that they have received all Addenda issued during the bidding period. Work required by Addenda shall automatically become part of the Contract Documents.

- 4.1.7 Make no additional stipulations on the Bid Form and do not qualify the Bid in any other manner.
- 4.1.8 Each copy of the Bid shall include the legal name of the Bidder and a statement as to whether the Bidder is a sole proprietor, a partnership, a corporation, or any legal entity, and each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current Power of Attorney attached, certifying agent's authority to bind the Bidder.
- 4.1.9 Bidder shall complete the Non-Collusion Statement form included with the Bid Forms and include it with their Bid.
- 4.1.10 In the construction of all Public Works Projects for the State of Delaware or any agency thereof, preference in employment of laborers, workers or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State.

4.2 BID SECURITY

- 4.2.1 All bids shall be accompanied by a deposit of either a good and sufficient bond to the Agency for the benefit of the Agency, with corporate surety authorized to do business in this State, the form of the bond and the surety to be approved by the Agency, or a security of the bidder assigned to the Agency, for a sum equal to at least 10% of the bid plus all add alternates, or in lieu of the bid bond a security deposit in the form of a certified check, bank treasurer's check, cashier's check, money order, or other prior approved secured deposit assigned to the State. The bid bond need not be for a specific sum, but may be stated to be for a sum equal to 10% of the bid plus all add alternates to which it relates and not to exceed a certain stated sum, if said sum is equal to at least 10% of the bid. The Bid Bond form used shall be the standard Office of Management and Budget (OMB) form (attached).
- 4.2.2 The Agency has the right to retain the bid security of Bidders to whom an award is being considered until either a formal contract has been executed and bonds have been furnished or the specified time has elapsed so the Bids may be withdrawn or all Bids have been rejected.
- 4.2.3 In the event of any successful Bidder refusing or neglecting to execute a formal contract and bond within 20 days of the awarding of the contract, the bid bond or security deposited by the successful bidder shall be forfeited.

4.3 SUBCONTRACTOR LIST

- 4.3.1 As required by Delaware Code, Title 29, section 6962(d)(10)b, each Bidder shall submit with their Bid a completed List of Sub-Contractors included with the Bid Form. NAME ONLY ONE SUBCONTRACTOR FOR EACH TRADE. The List of Sub-Contractor categories, established at, or subsequent to, the Pre-Bid Meeting, will be issued by the Owner and mailed to all prospective bidders who have obtained bidding documents. A Bid will be considered non-responsive unless the completed list is included.
- 4.3.2 Provide the Name and Address for each listed Subcontractor. Addresses by City, Town or Locality, plus State, will be acceptable.

4.3.3 It is the responsibility of the Contractor to ensure that their Subcontractors are in compliance with the provisions of this law. Also, if a Contractor elects to list themselves as a Subcontractor for any category, they must specifically name themselves on the Bid Form and be able to document their capability to act as Subcontractor in that category in accordance with this law.

#### 4.4 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

4.4.1 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, color, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting agency setting forth this nondiscrimination clause.
- .2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that "all qualified applicants will receive consideration for employment without regard to race, creed, color, sexual orientation, gender identity, or national origin."

#### 4.5 PREVAILING WAGE REQUIREMENT

- 4.5.1 Wage Provisions: In accordance with Delaware Code, Title 29, Section 6960, renovation projects whose total cost shall exceed \$15,000, and \$100,000 for new construction, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.
- 4.5.2 The prevailing wage shall be the wage paid to a majority of employees performing similar work as reported in the Department's annual prevailing wage survey or in the absence of a majority, the average paid to all employees reported.
- 4.5.3 The employer shall pay all mechanics and labors employed directly upon the site of work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.
- 4.5.4 The scale of the wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work.
- 4.5.5 Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

4.6 SUBMISSION OF BIDS

- 4.6.1 Enclose the Bid, the Bid Security, and any other documents required to be submitted with the Bid in a sealed opaque envelope. Address the envelope to the party receiving the Bids. Identify with the project name, contract number, bid opening date and time, and the Bidder's name and address. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof. The State is not responsible for the opening of bids prior to bid opening date and time that are not properly marked.
- 4.6.2 Deposit Bids at the designated location prior to the time and date for receipt of bids indicated in the Advertisement for Bids. Bids received after the time and date for receipt of bids will be marked "LATE BID" and returned.
- 4.6.3 Bidder assumes full responsibility for timely delivery at location designated for receipt of bids.
- 4.6.4 Oral, telephonic or telegraphic Bids are invalid and will not receive consideration.
- 4.6.5 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are then fully in compliance with these Instructions to Bidders.

4.7 MODIFICATION OR WITHDRAW OF BIDS

- 4.7.1 Prior to the closing date for receipt of Bids, a Bidder may withdraw a Bid by personal request and by showing proper identification to the Architect. A request for withdraw by letter or fax, if the Architect is notified in writing prior to receipt of fax, is acceptable. A fax directing a modification in the bid price will render the Bid informal, causing it to be ineligible for consideration of award. Telephone directives for modification of the bid price shall not be permitted and will have no bearing on the submitted proposal in any manner.
- 4.7.2 Bidders submitting Bids that are late shall be notified as soon as practicable and the bid shall be returned.
- 4.7.3 A Bid may not be modified, withdrawn or canceled by the Bidder during a thirty (30) day period following the time and date designated for the receipt and opening of Bids, and Bidder so agrees in submitting their Bid. Bids shall be binding for 30 days after the date of the Bid opening.

**ARTICLE 5: CONSIDERATION OF BIDS**

5.1 OPENING/REJECTION OF BIDS

- 5.1.1 Unless otherwise stated, Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids will be made available to Bidders.
- 5.1.2 The Agency shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid Security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.
- 5.1.3 If the Bids are rejected, it will be done within thirty (30) calendar days of the Bid opening.

## 5.2 COMPARISON OF BIDS

- 5.2.1 After the Bids have been opened and read, the bid prices will be compared and the result of such comparisons will be made available to the public. Comparisons of the Bids may be based on the Base Bid Items plus desired Alternate Items accepted by the Agency which produces the lowest bid. The Bid Items accepted will be those determined by the Agency to be in the best interest of the State and in accordance with available funding. The Agency reserves the right to award, within each Bid Item, a greater or lesser Quantity than that stated on the Bid Form at the Unit Price indicated on the Bid Form. The Agency shall have the right to accept Alternates in any order or combination.
- 5.2.2 The Agency reserves the right to waive technicalities, to reject any or all Bids, or any portion thereof, to advertise for new Bids, to proceed to do the Work otherwise, or to abandon the Work, if in the judgment of the Agency or its agent(s), it is in the best interest of the State.
- 5.2.3 An increase or decrease in the quantity for any item is not sufficient grounds for an increase or decrease in the Unit Price.
- 5.2.4 The prices quoted are to be those for which the material will be furnished F.O.B. Job Site and include all charges that may be imposed during the period of the Contract.
- 5.2.5 No qualifying letter or statements in or attached to the Bid, or separate discounts will be considered in determining the low Bid except as may be otherwise herein noted. Cash or separate discounts should be computed and incorporated into Unit Bid Price(s).

## 5.3 DISQUALIFICATION OF BIDDERS

- 5.3.1 An agency shall determine that each Bidder on any Public Works Contract is responsible before awarding the Contract. Factors to be considered in determining the responsibility of a Bidder include:
- .1 The Bidder's financial, physical, personnel or other resources including Subcontracts;
  - .2 The Bidder's record of performance on past public or private construction projects, including, but not limited to, defaults and/or final adjudication or admission of violations of the Prevailing Wage Laws in Delaware or any other state;
  - .3 The Bidder's written safety plan;
  - .4 Whether the Bidder is qualified legally to contract with the State;
  - .5 Whether the Bidder supplied all necessary information concerning its responsibility; and,
  - .6 Any other specific criteria for a particular procurement, which an agency may establish; provided however, that, the criteria be set forth in the invitation to bid and is otherwise in conformity with State and/or Federal law.
- 5.3.2 If an agency determines that a Bidder is nonresponsive and/or nonresponsible, the determination shall be in writing and set forth the basis for the determination. A copy of the determination shall be sent to the affected Bidder within five (5) working days of said determination.

5.3.3 In addition, any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of their Bid or Bids.

- .1 More than one Bid for the same Contract from an individual, firm or corporation under the same or different names.
- .2 Evidence of collusion among Bidders.
- .3 Unsatisfactory performance record as evidenced by past experience.
- .4 If the Unit Prices are obviously unbalanced either in excess or below reasonable cost analysis values.
- .5 If there are any unauthorized additions, interlineation, conditional or alternate bids or irregularities of any kind which may tend to make the Bid incomplete, indefinite or ambiguous as to its meaning.
- .6 If the Bid is not accompanied by the required Bid Security and other data required by the Bidding Documents.
- .7 If any exceptions or qualifications of the Bid are noted on the Bid Form.

#### 5.4 ACCEPTANCE OF BID AND AWARD OF CONTRACT

5.4.1 A formal Contract shall be executed with the successful Bidder within twenty (20) calendar days after the award of the Contract.

5.4.2 Per Section 6962(d)(13) a., Title 29, Delaware Code, The contracting agency shall award any Public Works Contract within thirty (30) days of the bid opening to the lowest responsive and responsible Bidder, provided the amount of the low bid does not exceed the amount of funds available to the Owner to finance the contract, unless the Agency elects to award on the basis of best value, in which case the election to award on the basis of best value shall be stated in the invitation to bid.

5.4.3 Each Bid on any Public Works Contract must be deemed responsive by the Agency to be considered for award. A responsive Bid shall conform in all material respects to the requirements and criteria set forth in the Contract Documents and specifications.

5.4.4 The Agency shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid, plus accepted Alternates.

5.4.5 The successful Bidder shall execute a formal Contract, submit the required Insurance Certificate, and furnish good and sufficient Bonds, unless specifically waived in the General Requirements, in accordance with the General Requirement, within twenty (20) days of official notice of contract award. Bonds shall be for the benefit of the Agency with surety in the amount of 100% of the total contract award. Said Bonds shall be conditioned upon the faithful performance of the Contract. Bonds shall remain in effect for a period of two years after the date of Substantial Completion.

5.4.6 If the successful Bidder fails to execute the required Contract and Bond, as aforesaid, within twenty (20) calendar days after the date of official Notice of the Award of the Contract, their Bid Guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a forfeiture or as

a penalty. Award will then be made to the next lowest qualified Bidder of the Work or readvertised, as the Agency may decide.

5.4.7 Prior to receiving an award, the successful Bidder shall furnish to the Agency proof of State of Delaware Business Licensure. If the Bidder does not currently have a Business License, they may obtain an application by writing to: Division of Revenue, Carvel State Office Building, 820 French Street, Wilmington, DE 19899. A copy of the letter written to the Division of Revenue, sent with your Bid will be adequate proof for your firm to be considered for award until such time as you receive your license.

5.4.8 The Bid Security shall be returned to the successful Bidder upon the execution of the formal contract. The Bid Securities of unsuccessful bidders shall be returned within thirty (30) calendar days after the opening of the Bids.

#### **ARTICLE 6: POST-BID INFORMATION**

##### **6.1 CONTRACTOR'S QUALIFICATION STATEMENT**

6.1.1 Bidders to whom award of a Contract is under consideration shall, if requested by the Agency, submit a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a statement has been previously required and submitted.

##### **6.2 BUSINESS DESIGNATION FORM**

6.2.1 Successful Bidder shall be required to accurately complete an Office of Management and Budget Business Designation Form for Subcontractors.

#### **ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND**

##### **7.1 BOND REQUIREMENTS**

7.1.1 The cost of furnishing the required Bonds, that are stipulated in the Bidding Documents, shall be included in the Bid.

7.1.2 If the Bidder is required by the Agency to secure a Bond from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

7.1.3 The Performance and Payment Bond forms used shall be the standard Office of Management and Budget (OMB) forms (attached).

##### **7.2 TIME OF DELIVERY AND FORM OF BONDS**

7.2.1 The Bonds shall be dated on or after the date of the Contract.

7.2.2 The Bidder shall require the attorney-in-fact who executes the required Bonds on behalf of the surety to affix a certified and current copy of the power of attorney.

#### **ARTICLE 8: FORM OF AGREEMENT BETWEEN OWNER (AGENCY) AND CONTRACTOR**

8.1 Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum.

END OF SECTION 00100 - INSTRUCTIONS TO BIDDERS

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SANITARY SEWER REHABILITATION – SEWER LINING      DIVISION of PARKS AND RECREATION  
 CAPE HENLOPEN STATE PARK  
 SANITARY SEWER REHABILITATION – SEWER LINING  
 CONTRACT No. 2014-CH-100

**BID FORM**

For Bids Due: April 28, 2014

To: Dept. of Natural Resources & Environmental Control  
 Division of Parks & Recreation  
 Office of Design and Development (Auditorium)  
 89 Kings Highway Dover, DE 19901

Name of Bidder: \_\_\_\_\_

Delaware Business License No.: \_\_\_\_\_

Employers Identification No.: \_\_\_\_\_

Phone No.: (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ Fax No.: (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, that he has familiarized himself with all conditions affecting the prosecution of the work including the availability of materials and labor, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

**BASE BID – MAIN LINE PIPE CURED-IN-PLACE LINING**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Base Bid Mobilization (Maximum of 5% of Bid Items 2 through 18 shown below)	LS	1		
3	Bypass Pumping	LS	1		
4	Restoration	LS	1		
7	Light Cleaning Sewer Pipe 6" to 10"	LF	8,500		
8	Heavy Cleaning of 6", 8" and 10" Sewer Pipes				

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 CONTRACT No. 2014-CH-100

**BID FORM**

	8A – Easement Reel Not Required	HR	12		
	8B – Easement Reel Required	HR	12		
10	Television Inspection of 6", 8" and 10" Sanitary Sewer Pipes	LF	8,500		
12	Cured in Place Pipe Main Line Liner				
	12A - 6" CIPP Main Line Liner	LF	4,000		
	12B - 8" CIPP Main Line Liner	LF	3,250		
	12C - 10" CIPP Main Line Liner	LF	750		
	12D - Reinstate Active Lateral Connections to Lined Pipe	EA	10		
13	Removal of Protruding Service Connections	EA	5		
16	Dye Testing Service Connections	EA	15		
17	3' Sectional CIPP Liner Repair of 6" Pipe	EA	2		
18	Grout	GAL	3,000	\$9.00	\$27,000.00
19	Pre-Liner				
	19A – 6" Pre-liner	LF	2,000		
	19B – 8" Pre-liner	LF	1,625		
	19C – 10" Pre-liner	LF	750		
20	Packer Injection Chemical Grouting				
	20A - Sewer Pipe Joint Packer Injection Chemical Grouting 6" to 10" pipe	EA	2,000		
	20B - Lateral Connection Packer Injection Grouting 6" to 10" pipe	EA	10		
21	Allowance No. 1 – Inspection Services	LS	1	\$50,000.00	\$50,000.000
	<b>BASE BID TOTAL</b>				

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**BID FORM**

**ALTERNATE NO. 1 – LATERAL PIPE CURED-IN-PLACE LINING & CLEANOUT INSTALLATION**

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Alternate Mobilization (Maximum of 5% of Bid Items 2 through 18 shown below)	LS	1		
3	Bypass Pumping	LS	1		
4	Restoration	LS	1		
5	Light Cleaning Sewer Lateral Pipe 4" to 6"	LF	600		
6	Heavy Cleaning of 4" and 6" Sewer Lateral Pipes	HR	40		
9	Television Inspection of 4" to 6" Sanitary Sewer Lateral Pipes	LF	600		
11	Cured in Place Pipe Lateral Lining				
	11A - Lateral Pipe Liner – 6" Main Interface Seal and 3'-0" of 4" or 6" Lateral Liner	EA	8		
	11B - Lateral Pipe Liner – 8" Main Interface Seal and 3'-0" of 4" or 6" Lateral Liner	EA	2		
	11C - Lateral Pipe Liner – 10" Main Interface Seal and 3'-0" of 4" or 6" Lateral Liner	EA	2		
	11D - Lateral Pipe Liner per LF of Lateral Liner Beyond Bid Length of 3'-0" - 6" Main	LF	250		
	11E - Lateral Pipe Liner per LF of Lateral Liner Beyond Bid Length of 3'-0" - 8" Main	LF	75		
	11F - Lateral Pipe Liner per LF of Lateral Liner Beyond Bid Length of 3'-0" - 10" Main	LF	150		
14	Sanitary Sewer Lateral Spot Repairs	EA	1		
15	Clean Out Installation in Existing Lateral Pipes	EA	15		

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**BID FORM**

18	Grout	GAL	50	\$9.00	
	<b>ALTERNATE NO. 1 TOTAL</b>				

Unit Prices have been computed in accordance with the Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements and other applicable Specification sections.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

Award of the bid will be based on the lowest Grand Total, which is the summation of the Base Bid and the Alternate Bid. Bidder acknowledges that the Alternative Bid may not be awarded at the sole discretion of the Owner.

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CONTRACT No. 2014-CH-100

**BID FORM**

I/We acknowledge Addendums numbered \_\_\_\_\_ and the price(s) include any cost/schedule impact they may have.

I/We agree that any changes in the scope of the work extra to the Contract requirements will be paid for pursuant to AIA Document A201, Article 7.

The bid shall remain valid and cannot be withdrawn for a period of thirty (30) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work of the Contract in accordance with the Construction Schedule and/or completion dates included with the Bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm: that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

I/We agree that all applicable Federal, State, and local taxes and cost of required insurance are included in the proposed prices.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents. This Proposal shall be attached as Exhibit A and made part of the Agreement executed by the Bidder.

I/We are licensed, or have initiated the license application as required by Section 2502, Chapter 25, Title 30, of the Delaware Code.

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**BID FORM**

I am / We are (Check one):

\_\_\_\_\_ **An Individual.**

\_\_\_\_\_ **A Partnership** duly recorded in the Prothonatary's Office in \_\_\_\_\_ County pursuant to Title 6 Delaware Code, Chapter 31.

\_\_\_\_\_ **A Corporation** registered with the State of Delaware pursuant to Title 8 Delaware Code.

By \_\_\_\_\_  
(Individual's / General Partner's / Corporate Name)

Trading as \_\_\_\_\_

State of Corporation \_\_\_\_\_

Business Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Witness:** \_\_\_\_\_ **By:** \_\_\_\_\_  
(Authorized Signature)

(CORPORATE SEAL, if applicable) \_\_\_\_\_  
Typed or printed name

\_\_\_\_\_  
(Title)

**Date:** \_\_\_\_\_

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**BID FORM**

STATE OF \_\_\_\_\_)

\_\_\_\_\_ COUNTY) ss,

I hereby certify that before me this \_\_\_\_\_ day of \_\_\_\_\_,  
20 \_\_\_\_\_, personally appeared \_\_\_\_\_, in  
his official capacity as President/Principal, and acknowledged the aforesaid before me.

Given under by hand and notarial seal.

\_\_\_\_\_  
Notary Public

**ATTACHMENTS**

Non-Collusion Statement  
Sub-Contractor List  
Bid Security (certified check or bid bond issued on mandatory form)  
(Others as Required by Project Manual)

**BID FORM**

**NON-COLLUSION STATEMENT**

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date to the Department of Natural Resources and Environmental Control, Division of Parks and Recreation.

All the terms and conditions of Contract No. \_\_\_\_\_ have been thoroughly examined and understood.

**Name of Bidder:** \_\_\_\_\_

**Authorized Representative  
(Typed or Printed):** \_\_\_\_\_

**Authorized Representative  
(Signature):** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Address of Bidder:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Phone Number:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_  
20\_\_\_\_.

My Commission expires \_\_\_\_\_. NOTARY PUBLIC \_\_\_\_\_.

**This Page Must Be Signed And Notarized For Your Bid To Be Considered.**

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**BID FORM**

**SUBCONTRACTOR LIST**

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address (City and State) of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.

The bid may be considered non-responsive if this form is incomplete.

**Subcontractor Category**

**Subcontractor Information**

(Address: City & State- no street address required)

- |          |                |
|----------|----------------|
| 1. _____ | Name: _____    |
|          | Address: _____ |
| 2. _____ | Name: _____    |
|          | Address: _____ |
| 3. _____ | Name: _____    |
|          | Address: _____ |
| 4. _____ | Name: _____    |
|          | Address: _____ |
| 5. _____ | Name: _____    |
|          | Address: _____ |

**SAMPLE**

SANITARY SEWER REHABILITATION – SEWER LINING      DIVISION of PARKS AND RECREATION  
CAPE HENLOPEN STATE PARK  
SANITARY SEWER REHABILITATION – SEWER LINING  
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**BID FORM**

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**BID BOND**

TO ACCOMPANY PROPOSAL  
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: \_\_\_\_\_  
\_\_\_\_\_ of \_\_\_\_\_ in the County of \_\_\_\_\_  
\_\_\_\_\_ and State of \_\_\_\_\_ as **Principal**, and \_\_\_\_\_  
\_\_\_\_\_ of \_\_\_\_\_ in the County of \_\_\_\_\_  
and State of \_\_\_\_\_ as **Surety**, legally authorized to do business in the State of Delaware  
("State"), are held and firmly bound unto the **State** in the sum of \_\_\_\_\_  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_), or \_\_\_\_\_ percent not to exceed \_\_\_\_\_  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
of amount of bid on Contract No. \_\_\_\_\_, to be paid to the **State** for the use and  
benefit of the Department of Natural Resources and Environmental Control for which payment well  
and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators,  
and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden  
**Principal** who has submitted to the Department of Natural Resources and Environmental Control a  
certain proposal to enter into this contract for the furnishing of certain material and/or services  
within the **State**, shall be awarded this Contract, and if said **Principal** shall well and truly enter into  
and execute this Contract as may be required by the terms of this Contract and approved by the  
Department of Natural Resources and Environmental Control this Contract to be entered into within  
twenty days after the date of official notice of the award thereof in accordance with the terms of  
said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with \_\_\_\_\_ seal and dated this \_\_\_\_\_ day of \_\_\_\_\_ in the year of our Lord  
two thousand and \_\_\_\_\_ (20\_\_\_\_).

SEALED, AND DELIVERED IN THE  
Presence of

\_\_\_\_\_  
Name of Bidder (Organization)

Corporate  
Seal

By:

\_\_\_\_\_  
Authorized Signature

Attest \_\_\_\_\_

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name of Surety

Witness: \_\_\_\_\_

By:

\_\_\_\_\_

\_\_\_\_\_  
Title

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# Employing Delawareans Reporting Requirements for Bidders

Consistent with Section 40 of Senate Bill 130, below are reporting requirements that must be filled out for projects funded through "Building Delaware's Future Now Fund". This information shall be submitted along with your bid proposal.

Contractor Name: \_\_\_\_\_

Project Name: \_\_\_\_\_

1. The number of people reasonably anticipated to be employed on the project (excluding subcontractors): \_\_\_\_\_
2. The number and percentage of such employees who are bona fide legal residents of the State:  
Number: \_\_\_\_\_ Percentage: \_\_\_\_\_
3. The total number of employees of the bidder: \_\_\_\_\_
4. The total percentage of employees of such bidder who are bona fide residents of the State:  
\_\_\_\_\_
5. To the extent subcontractors are to be employed, the bidder shall disclose its reasonable, good faith determination of the number and percentage of employees of such subcontractors who are bona fide legal residents of the State: Number: \_\_\_\_\_ Percentage: \_\_\_\_\_

**No bid for any contract hereunder shall be responsive unless the prospective bidder discloses the information requested.**

Bona Fide Delaware resident is defined in section 40 paragraph d: *(d) For purposes of this section, "bona fide legal resident of this State" shall mean any resident who has established residence of at least 90 days in the State.*

**All contractors awarded contracts hereunder shall submit a report to the Director of the Office of Management and Budget setting forth the actual number and percentage of employees of such contractor who are bona fide legal residents of the State. To the extent subcontractors are employed in connection with any such contractor, the contractor shall further disclose the actual number and percentage of employees of such subcontractor who are bona fide legal residents of the State. Such report shall be due on the earlier of 30 days from the completion of the project or December 31 of each calendar year.**

.....

**To be filled out by Awarding State Agency/Organization:**

State Agency Name: \_\_\_\_\_

Point of Contact & Phone Number: \_\_\_\_\_

Bid (\$) Amount: \_\_\_\_\_

Appropriation Number: \_\_\_\_\_

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## **AGREEMENT FORM A101-2007**

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor," AIA Document A101-2007. Where a portion of the Standard Form of Agreement is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement shall remain in effect.

### **ARTICLE 5: PAYMENTS**

#### 5.1    PROGRESS PAYMENTS

5.1.3 Delete paragraph 5.1.3 in its entirety and replace with the following:

"Provided that a valid Application for Payment is received by the Architect that meets all requirements of the Contract, payment shall be made by the Owner not later than 30 days after the Owner receives the valid Application for Payment."

### **ARTICLE 6: DISPUTE RESOLUTION**

#### 6.2    BINDING DISPUTE RESOLUTION

Check "Other" – and add the following sentence:

"Any remedies available in law or in equity."

### **ARTICLE 8: MISCELLANEOUS PROVISIONS**

8.2    Insert the following:

"Payments are due 30 days after receipt of a valid Application for Payment. After that 30 day period, interest may be charged at the rate of 1% per month not to exceed 12% per annum."

8.5    Delete paragraph 8.5 in its entirety and replace with the following:

"The Contractor's representative shall not be changed without ten days written notice to the Owner."

END OF SECTION 00500 - AGREEMENT FORM

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STATE OF DELAWARE  
OFFICE OF MANAGEMENT AND BUDGET

**PERFORMANCE BOND**

Bond Number: \_\_\_\_\_

KNOW ALL PERSONS BY THESE PRESENTS, that we, \_\_\_\_\_, as principal ("**Principal**"), and \_\_\_\_\_, a \_\_\_\_\_ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the State of Delaware, Department of Natural Resources and Environmental Control, Division of Parks and Recreation ("**Owner**"), in the amount of \_\_\_\_\_ (\$ \_\_\_\_\_), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrators, successors and assigns, jointly and severally, for and in the whole, firmly by these presents.

Sealed with our seals and dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. \_\_\_\_\_ dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly provide and furnish all materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and the Contract Documents (as defined in the Contract) or any changes or modifications thereto made as therein provided, shall make good and reimburse **Owner** sufficient funds to pay the costs of completing the Contract that **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

**Surety**, for value received, hereby stipulates and agrees, if requested to do so by **Owner**, to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof, if for any cause **Principal** fails or neglects to so fully perform and complete such work.

**Surety**, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

**Surety** hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: \_\_\_\_\_

Witness or Attest: Address: \_\_\_\_\_

\_\_\_\_\_  
Name:

(Corporate Seal)

By: \_\_\_\_\_(SEAL)

Name:

Title:

SURETY

Name: \_\_\_\_\_

Witness or Attest: Address: \_\_\_\_\_

\_\_\_\_\_  
Name:

(Corporate Seal)

By: \_\_\_\_\_(SEAL)

Name:

Title:

STATE OF DELAWARE  
OFFICE OF MANAGEMENT AND BUDGET

**PAYMENT BOND**

Bond Number: \_\_\_\_\_

KNOW ALL PERSONS BY THESE PRESENTS, that we, \_\_\_\_\_, as principal ("**Principal**"), and \_\_\_\_\_, a \_\_\_\_\_ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the State of Delaware, Department of Natural Resources and Environmental Control, Division of Parks and Recreation ("**Owner**"), in the amount of \_\_\_\_\_ (\$\_\_\_\_\_), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrators, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

Sealed with our seals and dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. \_\_\_\_\_ dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly pay all and every person furnishing materials or performing labor or service in and about the performance of the work under the Contract, all and every sums of money due him, her, them or any of them, for all such materials, labor and service for which **Principal** is liable, shall make good and reimburse **Owner** sufficient funds to pay such costs in the completion of the Contract as **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

**Surety**, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

**Surety** hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: \_\_\_\_\_

Witness or Attest: Address: \_\_\_\_\_

\_\_\_\_\_  
Name:

(Corporate Seal)

By: \_\_\_\_\_(SEAL)

Name:  
Title:

SURETY

Name: \_\_\_\_\_

Witness or Attest: Address: \_\_\_\_\_

\_\_\_\_\_  
Name:

(Corporate Seal)

By: \_\_\_\_\_(SEAL)

Name:  
Title:

**SECTION 00600 - BONDS, CERTIFICATES AND ADMINISTRATIVE FORMS****TABLE OF ARTICLES**

1. Related Work Specified Elsewhere
2. Forms Submitted By Contractor
3. Forms Prepared by Owner

**ARTICLE 1: Related Work Specified Elsewhere:**

Section 00100 Instructions to Bidders  
Section 00300 Bid Form  
Section 00500 Agreement Form  
Section 00700 General Conditions  
Section 00710 General Requirements  
Section 00800 Supplementary General Conditions

**ARTICLE 2: Forms Submitted By Contractor:**

- 2.1 Reference is made throughout this Project Manual to a number of standard forms which the Contractor is required to submit to the Owner prior to and during the execution of Work of this Project.
- 2.2 The Contractor shall be responsible for obtaining and submitting the following forms to the Owner when the forms are completed as specified.
- 2.3 Prior to commencing work, submit forms:
  - .1 AIA Document G715 "Acord Certificate of Insurance" (Latest Edition).
  - .2 "Performance Bond" and "Payment Bond" (Samples enclosed) Use of these forms is mandatory.
- 2.4 During the execution of the work, as appropriate, and prior to final payment, submit forms:
  - .1 AIA Document G702 "Application and Certificate for Payment".
  - .2 AIA Document G703 "Continuation Sheet" for G702, "Application and Certificate for Payment".
  - .3 AIA Document G706 "Contractor's Affidavit of Payment of Debts and Claims" (Latest Edition).
  - .4 AIA Document G706A "Contractor's Affidavit of Release of Liens" (Latest Edition).
  - .5 AIA Document G707 "Consent of Surety to Final Payment" (Latest Edition).
  - .6 AIA Document G707A "Consent of Surety to Reduction in or Partial Release of Retainage" (Latest Edition).
  - .7 Payroll Report (Sample Enclosed).
  - .8 "Employing Delawareans Reporting Requirements for Awarded Contracts" (when required).

- 2.5 The forms specified above are available for examination in the Owner's office by prospective Bidders. Failure to examine the specified documents and to make allowances for them in his Bid, shall not relieve the Contractor from using the forms and complying with their requirements.

**ARTICLE 3: Forms Prepared by Owner:**

- 3.1 The Owner shall prepare the following standard forms, as appropriate:
- .1 AIA Document A101-2007 "Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum".
  - .2 AIA Document G701 "Change Order" (Latest Edition).
  - .3 AIA Document G704 "Certificate of Substantial Completion" (Latest Edition).
  - .4 AIA Document G714 "Construction Change Directive" (Latest Edition).

END OF SECTION 00600 – BONDS CERTIFICATES AND ADMINISTRATIVE FORMS



DATE \_\_\_\_\_

I, \_\_\_\_\_ (Name of signatory party) \_\_\_\_\_ (Title)

do hereby state:

1. That I pay or supervise the payment of persons employed by

\_\_\_\_\_, \_\_\_\_\_ on the \_\_\_\_\_ (Contractor or Subcontractor)

(public project)

that during the payroll period commencing on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ and ending on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ all persons employed on said project

have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of the contractor or subcontractor from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in the prevailing wage regulations of the State of Delaware.

2. That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work performed.

3. That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a state apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, and that the worksite ratio of apprentices to mechanics does not exceed the ratio permitted by the prevailing wage regulations of the State of Delaware.

**An employer who fails to submit sworn payroll information to the Department of Labor weekly shall be subject to fines of \$1,000.00 and \$5,000. for each violation.**

List only those fringe benefits:

For which the employer has paid, and Which have been used to offset the full prevailing wage rate.

(See Delaware Prevailing Wage Regulations for explanation of how hourly value of benefits is to be computed.)

HOURLY COST OF BENEFITS	
(List in same order shown on front of record)	
Employee	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

I hereby certify that the foregoing information is true and correct to the best of my knowledge and belief. I realize that making a false statement under oath is a crime in State of Delaware

Signature \_\_\_\_\_

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

SWORN TO AND SUBSCRIBED BEFORE ME, A NOTARY PUBLIC,

THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, A.D. 20\_\_\_\_

Notary Public \_\_\_\_\_

**Davis-Bacon and Related Acts (DBRA) Provisions and Procedures for EPA  
Funded Projects Executed Between October 30, 2009 and September 30, 2010  
or required under Continuing Resolution**

**A Supplement to the CWSRF Program Requirements**

**January 28, 2010**  
**Updated April 5, 2011**

## I. Introduction

The Davis Bacon Act requires that all contractors and subcontractors performing construction, alteration and repair work under federal contracts in excess of \$2,000 pay their laborers and mechanics not less than the prevailing wage and fringe benefits. Projects executed between October 30, 2009 and September 30, 2010 (or projects subject to Davis-Bacon under Continuing Resolution) are subject to the Davis-Bacon provisions through completion of construction and must comply with the following:

- A. This contract clause pertains to minimum wages for any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole, or in part, from federal funds or in accordance with guarantees of a federal agency or financed from funds obtained by pledge of any contract of a federal agency to make a loan, grant or annual contribution.
  1. **Minimum wages.** All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account, the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor at the following web site [www.wdol.gov/dba.aspx](http://www.wdol.gov/dba.aspx), regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. A "wage determination" is the listing of wage and fringe benefit for each classification of laborers and mechanics which the Administrator of the Wage and Hour Division of the U.S. Department of Labor has determined to be prevailing in a given area for a particular type of construction (e.g., building, heavy, highway, or residential). The wage determination (including any additional classification and wage rates) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. The poster may be downloaded from: <http://www.dol.gov/esa/whd/regs/compliance/posters/fedprojc.pdf>
  2. **Withholding.** In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the regulations, the loan or grant recipient may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.
  3. **Payrolls and basic records.** Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of **three years** thereafter for all laborers and mechanics working at the site

of the work. The contractor shall submit weekly for each week in which any contract work is performed, a copy of all payrolls to the recipient, sponsor, or owner. The required weekly payroll information may be submitted in any form desired. A contractor may use Form WH-347 which is available from the Wage and Hour Division web site at: <http://www.dol.gov/esa/whd/forms/wh347.pdf>.

4. **Subcontracts.** The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with the requirements above, the requirements identified in the Davis Bacon Terms and Conditions of the EPA assistance agreement, and the contract clauses in 29 CFR 5.5, which can be found at <http://ecfr.gpoaccess.gov/>
- B. **Contract Work Hours and Safety Standards Act.** In any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act, the following clauses shall apply:
1. **Overtime requirements.** No contractor or subcontractor for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. The overtime rate of time and one half does not apply to fringe payments. For work in excess of forty hours, fringe payments should continue to be paid on a per hour worked basis.
  2. **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (B) (1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States government, for liquidated damages.
  3. **Withholding for unpaid wages and liquidated damages.** The recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (B) (2) of this section.
  4. **Subcontracts.** The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (B) (1) through (4) of this section.
- C) In any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the contractor or subcontractor shall

maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of **three years**.

## **II. Davis Bacon Compliance Procedures**

A. **Before Contract Award** - Once it is determined that Davis Bacon wage rates will apply to a construction contract, the recipient's contracting organization must state in the solicitation that Davis Bacon Prevailing wage rates are applicable, and bid packages must include the current Davis Bacon general wage determination for the area where construction will occur. To select the prevailing wage rate determination for a specific locality:

- (i) Go to website <http://www.wdol.gov/>
- (ii) Select "DBA WDs"
- (iii) Input the State and County where the construction site is located.
- (iv) Input the type of construction for the project as Building, Heavy, Highway or Residential.

B. **Before Bid Opening**- The wage determination website should be continually monitored by the contracting organization for modifications. Generally, the most current published wage determination at the time of contract award must be incorporated into the contract. A wage determination update issued less than 10 days before bid opening shall be in effect unless there is not a reasonable time to notify all prospective bidders. In these cases the relevant facts should be documented in the contract file

A convenient way to monitor potential wage determination modifications is to sign up for the alert service as shown on the website <http://www.wdol.gov/>

C. **After Contract Award** - After solicitation, bid opening and contractor selection by the recipient contracting organization, the prevailing wage determination shall be included in the final construction contract between the recipient, sub recipient or borrower and its contractor.

In the event the construction contract is not awarded within 90 days of the bid opening date, any modification to the prevailing wage determination published prior to award of the contract shall be effective and should be included in the award documents, or by modification to the contract documents.

## **III. Applicability of the Davis-Bacon and Related Acts to EPA programs**

EPA capitalization grants to states, which provides loans to municipalities and other eligible entities for eligible projects, including wastewater water infrastructure projects, estuary projects, and non-point source projects.



Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

#### Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

---

#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division

U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====  
END OF GENERAL DECISION

STATE OF DELAWARE  
DEPARTMENT OF LABOR  
DIVISION OF INDUSTRIAL AFFAIRS  
OFFICE OF LABOR LAW ENFORCEMENT  
PHONE: (302) 451-3423

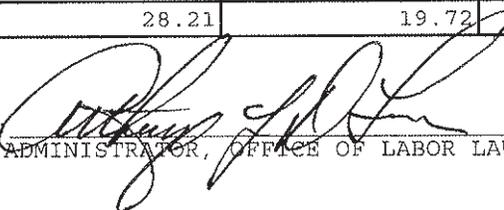
Mailing Address:  
225 CORPORATE BOULEVARD  
SUITE 104  
NEWARK, DE 19702

Located at:  
225 CORPORATE BOULEVARD  
SUITE 104  
NEWARK, DE 19702

PREVAILING WAGES FOR HEAVY CONSTRUCTION EFFECTIVE MARCH 15, 2013

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	21.14	18.60	40.43
BOILERMAKERS	69.82	30.73	56.37
BRICKLAYERS	44.98	22.19	23.83
CARPENTERS	50.06	50.06	39.82
CEMENT FINISHERS	23.15	23.30	17.35
ELECTRICAL LINE WORKERS	34.86	26.30	25.89
ELECTRICIANS	60.60	60.60	60.60
GLAZIERS	19.54	16.96	11.48
INSULATORS	51.48	51.48	51.48
IRON WORKERS	58.70	25.54	55.78
LABORERS	38.30	38.30	38.30
MILLWRIGHTS	62.18	62.18	48.75
PAINTERS	58.07	58.07	58.07
PILEDRIVERS	67.87	37.64	29.30
PLASTERERS	18.40	15.97	10.80
PLUMBERS/PIPEFITTERS/STEAMFITTERS	72.03	21.62	17.12
POWER EQUIPMENT OPERATORS	57.06	23.65	57.06
SHEET METAL WORKERS	29.40	18.23	17.13
SPRINKLER FITTERS	31.68	11.99	9.93
TRUCK DRIVERS	28.21	19.72	19.27

CERTIFIED: 5/15/13

BY:   
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

**NOTE:** THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 451-3423.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: Cape Henlopen State Park, Sanitary Sewer Rehabilitation - Sewer Lining, Sussex County

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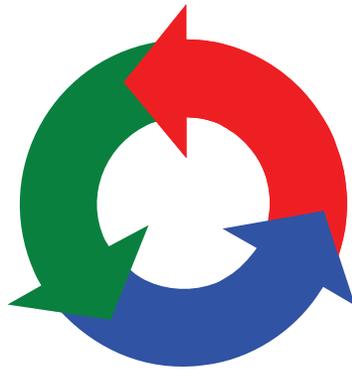
**SECTION 00650 – WATER POLLUTION CONTROL REVOLVING FUND  
REQUIREMENTS**

The Contractor is required to comply with all requirements of the Delaware Water Pollution Control Revolving Fund (WPCRF). The WPCRF requirements are detailed in the “Program Requirements” documents following this page.

END OF SECTION 00650 – WATER POLLUTION CONTROL REVOLVING FUND REQUIREMENTS

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# DELAWARE WATER POLLUTION CONTROL REVOLVING LOAN FUND



## PROGRAM REQUIREMENTS

Department of Natural Resources and Environmental Control  
Division of Water Resources  
Financial Assistance Branch  
89 Kings Highway  
Dover, DE 19901

Last revision: February 2010

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**SUBPART A**  
**Delaware Prevailing Wage Regulations**

The Project or Program to which the work covered by this contract pertains to is being assisted by the State of Delaware and the following provisions are included in this Contract pursuant to the provisions applicable to such Clean Water State Revolving Loan Fund (CWSRF) Program. Loan recipients or engineering representatives are to verify with the State of Delaware Department of Labor to the appropriate wage determination before they go out for competitive bidding.

Delaware Prevailing Wage Regulations, Worker Classifications, Current Prevailing Wage Rates and forms may be found at:

<http://www.delawareworks.com/industrialaffairs/services/LaborLawEnforcementInfo.shtml#pw1>

or by contacting:

State of Delaware  
Department of Labor  
Division of Industrial Affairs  
225 Corporate Blvd. Suite 104  
Newark, DE 19702  
Telephone No. (302) 761-8200

Weekly sworn payroll forms are also to be submitted to the same address.

**SUBPART B:  
Equal Opportunity Clause (41 CFR 60-1.4)**

**A. Executive Order 11246 (Applicable to Contracts/subcontracts above \$10,000).**

1. During the performance of this contract the contractor and all subcontractors agree as follows:
  - a. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin, such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection of training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
  - b. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
  - c. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
  - d. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
  - e. The contractor will furnish all information and reports required by the Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
  - f. In the event of the contractors' noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

- g. The contractor will include the portion of the sentence immediately preceding Paragraph (1) and the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**SUBPART C:**  
**Certification of Non-segregated Facilities (41 CFR 60-1.8)**

Bidders and offerers are cautioned as follows: By signing this bid or offer, the bidder or offerers will be deemed to have signed and agreed to the provisions of the "Certification of Nonsegregated Facilities" in this solicitation. The certification provides that the bidder or offerer does not maintain or provide for his employees facilities which are segregated on a basis of race, creed, color, or national origin, whether such facilities are segregated by directive or on a de facto basis. The certification also provides that he will not maintain such segregated facilities.

## SUBPART D

### **Disadvantaged Business Enterprise Regulations for Loan Recipients, Prime Contractors and Subcontractors (CFR Title 40, Part 33)**

#### **A. Introduction**

EPA's Disadvantaged Business Enterprise (DBE) rule applies to procurement actions funded in part by EPA assistance agreements awarded after May 27, 2008. Loan recipients, their prime contractors and DBE subcontractors are responsible for complying with these regulations during procurement of construction contracts, equipment purchase orders, service agreements (engineering, inspection, legal, etc) and supplies. A list of Fair Share Objectives, the Six Good Faith Efforts, responsibilities for loan recipients, prime contractors and DBE subcontractors and appendices A, B, C and D are as follows:

#### **B. Fair Share Objectives**

The DBE fair share objectives for the loan recipients and prime contractors of the Delaware State Revolving Fund Program (SRF) which includes Minority Business Enterprises (MBEs) and Women's Business Enterprises (WBEs) is as follows:

	<u><b>MBE - %</b></u>	<u><b>WBE - %</b></u>
1. Construction	2.49	3.69
2. Goods/Equipment Combined	11.69	12.62
3. Services	4.85	3.62
4. Supplies	2.41	2.41

The above goals are not a quota and apply to DBE participation only.

#### **C. Six Good Faith Efforts:**

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities; including placing qualified DBEs on solicitation lists and soliciting them whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs. Adjust time frames and delivery schedules to encourage participation by DBEs. Advertise for bids and proposals for at least 30 calendar days before bid closing date, unless circumstances require a shorter advertising period.
3. Divide total requirements of the project, when economically feasible, to permit maximum DBE participation.

4. Encourage contracting with a consortium of DBE's when a contract is too large for one of these firms to handle individually.
5. To obtain lists of DBE firms, use the services of the Delaware Department of Transportation (DelDOT), the United States Small Business Administration (SBA), and the Minority Business Development Agency (MDBA) of the U.S. Department of Commerce.
6. Require the prime contractor to follow steps 1 through 5, if prime contractor will be sub-contracting parts of the contract work.

**D. Loan Recipient's Responsibilities**

1. Adopt the fair share objectives of the State of Delaware revolving loan fund (SRF) or conduct an Availability Analysis of local DBE resources and negotiate fair share objectives with EPA Region III Office of Policy and Management. Loan recipients who receive a loan of \$250,000 or less are exempt from adopting fair share objectives. This exemption from adopting fair share objectives does NOT exempt a loan recipient from the other DBE responsibilities.
2. Include a copy of Appendix A from the DBE regulations in each contract with prime contractor (for construction, engineering, equipment purchases, etc) which is fully or partially funded with a SRF loan subjective to DBE requirements.
3. Apply the six good faith efforts during procurement of construction, equipment, services, and supplies in each contract which is fully or partially funded with a SRF loan subjective to DBE requirements.
4. Require the prime contractor to complete all applicable items on the lists of Prime Contractor's Pre-award and Post-Award Responsibilities under section E of this subpart. In addition, the request for bids/proposal should define which items need to be included in the bid opening envelope and if necessary, a time frame for submitting additional forms to complete the bid package. State procurement laws and policies may define the bidding requirements that need to be followed by the recipient.
5. Report semiannually DBE participation achievements to the State of Delaware SRF using EPA form 5700-52A, even if the reports are negative reports. Reports are due no more than 30 days after March 31 and September 30. Report must be submitted until the final loan payment is made.

6. Maintain records documenting compliance achieved with the requirements of the DBE regulations, including documentation of the SRF loan recipient and its prime contractor's good faith efforts. Documents to be maintained include solicitation lists, evidence of contacts with DBEs (copies of letters, telephone memos, e-mails), explanations of decisions, EPA forms 6100-3 and EPA 6100-4, bidders list for designated SRF projects, copy of advertisements and copies of EPA forms 5700-52A.
7. Maintain a list of all firms (not just DBEs) that bid or provided a quote on prime contracts and subcontracts. The list must include:
  - (a) Entity's name and point of contact;
  - (b) Mailing address, telephone number, e-mail address;
  - (c) The procurement on which the entity bid or quoted and when the bid or quote was provided;
  - (d) Entity's status as a DBE or non-DBE

The list must be maintained until the end of the project period (e.g., construction period or as long as receiving funds from the SRF).

**E. Prime Contractor Pre-Award Responsibilities**

1. Apply the six good faith efforts, if the prime contractor awards subcontracts.
2. Continue to apply the six good faith efforts even if the prime contractor has achieved the fair share objectives.
3. Provide EPA form number 6100-2 –*DBE Program Subcontractor Participation Form* and EPA form number 6100-3 –*DBE Program Subcontractor Performance Form* to each DBE subcontractor selected. These forms are included in Appendix D of this subpart or may be downloaded from EPA's Office of Small Business Programs website: <http://www.epa.gov/osbp/grants.htm>. EPA form number 6100-3 must be completed by each selected DBE subcontractor and submitted back to the prime contractor so the form can be included in the bid package.
4. Complete EPA form number 6100-4 - *DBE Program Subcontractor Utilization Form*. This form is also included in Appendix D of this subpart or may be downloaded from EPA's Office of Small Business Programs website: <http://www.epa.gov/osbp/grants.htm>. EPA form number 6100-4 must be completed by the prime contractor and included in the bid package.
5. Submit EPA form 6100-3 and 6100-4 to SRF loan recipient with bid package or proposal.

**F. Prime Contractor Post-Award Responsibilities**

1. Pay subcontractors for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the SRF loan recipient.
2. Notify the SRF loan recipient in writing prior to termination for convenience of a DBE subcontractor.
3. Employ the six good faith efforts if soliciting a replacement subcontractor after a DBE subcontractor fails to complete work under the subcontract for any reason.
4. Semiannually (on March 31 and September 30) inform the SRF loan recipient of DBE participation achieved for the required reporting.
5. Maintain records documenting compliance with DBE regulations, including documentation of the contractors good faith efforts

**G. DBE Subcontractor's Responsibilities**

1. Obtain certification as a DBE. Self certification is NOT acceptable for EPAs DBE program. DBE firms may be certified by the Small Business Administration (SBA), the State of Delaware Department of Transportation (DelDOT), or by a State, locality or independent private organization provided their applicable criteria match SBA applicable Business Development Program regulations.
2. May submit EPA form 6100-2-*DBE Subcontractor Participation Form* to Ms. Romona McQueen, EPA region III DBE Coordinator. This form gives a DBE an opportunity to describe the work they received from the prime contractor, how they were paid and any other concerns they may have.
3. Must complete EPA form 6100-3-*DBE Program Subcontractor Performance Form*, and submit it to the prime contractor soliciting services from the subcontractor.

**APPENDIX A:**  
**DBE Rule Term and Condition**

The following term and condition must be included in each procurement contract signed by an EPA loan recipient and their contractors:

*The contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in termination of this contract or other legally available remedies.*

Contractor: \_\_\_\_\_

Authorized Representative: \_\_\_\_\_

Date: \_\_\_\_\_

## APPENDIX B

### Examples of Good Faith Efforts

#### A. Loan Recipient

1. **Effort 1:** Awareness covers a variety of activities, including direct solicitation through mailings, phone calls or e-mails, advertizing through publications (newspapers, journals or Dodge reports) and/or listing on websites. Loan recipients should maintain the solicitation list and a narrative statement which explains how the contacts were selected as part of their DBE documentation.
2. **Effort 2:** Soliciting (advertizing) should include a minimum 30-calender days advertizing period. A publisher's affidavit is typically used to document the 30-day advertizing period. If the recipient deviates from this minimum, they should document the reasons for a shorter solicitation period.
3. **Effort 3:** Dividing the total project into smaller tasks is an option that needs to be considered on a project by project basis. A \$100 million waste water treatment plant project may have no economic advantage if it is broken down into smaller contracts whereas a \$10 million sewer collection system project may easily be broken down into several contracts. Dividing a project based on contractors discipline such as electrical HVAC (Heating, Ventilation and Air Conditioning) would be a measure of compliance with this effort.
4. **Effort 4:** Encouraging contracting with DBE consortium could be as simple as stating this option in the bid advertisement (newspaper notice), solicitation letters to DBEs, and/or in the instruction to bidders section of the specifications.
5. **Effort 5:** Contacting the State of Delaware DOT (DelDOT) or any State of Delaware Certifying Office for a list of certified DBE firms would be appropriate.
6. **Effort 6:** This part may be complied with by incorporating the SPECIAL NOTICE – Appendix C into the bidding documents.

#### B. Prime Contractors, if Subcontracting

1. **Effort 1:** The prime contract will place DBE's on the solicitation list. A prime contractor may have a limited amount of time to solicit subcontractors because of the 30-day advertisement period for the prime contract. The new regulations require the prime contractor to submit EPA forms 6100-3 and 6100-4 with the bid package. These forms will be part of the contractor's Good Faith Effort documentation.

2. **Effort 2:** The prime contractor will determine the time frames and delivery schedules for the contract. The prime contractor may have less than 30-days to solicit subcontractors. Depending upon the type of work being subcontracted, the time frame and delivery schedules can determine the availability of DBEs.
3. **Effort 3:** The prime contractor has to determine if the total requirements can be divided to allow smaller DBE firms to compete for the work.
4. **Effort 4:** Encouraging contracting with a consortium of DBEs when a subcontract is too large for one DBE firm to handle.
5. **Effort 5:** Prime contractors should be in contact with the State of Delaware DOT (DelDOT), Small Business Administration (SBA) and other Certifying Offices to develop their solicitation lists.
6. **Effort 6:** Not applicable to prime contractors.

## APPENDIX C:

### **SPECIAL NOTICE: Insert into the Instructions for Bidders**

- A. This is to advise bidders of the requirements of this program regarding the “Good Faith Efforts” necessary to be deemed a responsive and responsible bidder. The Federal Register Part 40 CFR 33.301 requires these Good Faith Efforts in procurement actions to assure that Disadvantaged Business Enterprises (DBE) are made aware of procurement opportunities in construction, equipment, services and supplies under EPA financial assistant agreements.
1. Ensure DBE’s are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities by placing qualified DBE’s on solicitation lists whenever they are potential sources.
  2. Establish delivery schedules, where the requirement permits to encourage participation by DBE’s. The loan recipient should allow a 30-day minimum advertising period for bidding.
  3. Dividing total requirements, when economically feasible, into small tasks or quantities, to permit maximum participation of DBE’s.
  4. Encourage contracting with a consortium of DBE’s when a contract is too large for one of these firms to handle individually.
  5. Using the services and of the Delaware Department of Transportation (DelDOT), the United States Small Business Administration (SBA), and the Minority Business Development Agency (MDBA) of the U.S. Department of Commerce.
  6. Require the prime contractor, if subcontracts are to be let, to take steps 1-5.

## **APPENDIX D: EPA FORMS**

- A. DBE Subcontractor Participation Form – **EPA FORM 6100-2**
- B. DBE Subcontractor Performance Form- **EPA FORM 6100-3**
- C. DBE Subcontractor Utilization Form- **EPA FORM 6100-4**

## Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Participation Form

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE<sup>1</sup> subcontractor<sup>2</sup> the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor

<sup>1</sup> A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

<sup>2</sup> Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program  
DBE Subcontractor Participation Form**

Please use the space below to report any concerns regarding the above EPA-funded project:

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<b>Subcontractor Signature</b>	<b>Print Name</b>
<b>Title</b>	<b>Date</b>

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

### Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Performance Form

This form is intended to capture the DBE<sup>1</sup> subcontractor's<sup>2</sup> description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: <input type="checkbox"/> DOT <input type="checkbox"/> SBA <input type="checkbox"/> Other: _____		Meets/ exceeds EPA certification standards? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown

<sup>1</sup> A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

<sup>2</sup> Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program  
DBE Subcontractor Performance Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

<b>Prime Contractor Signature</b>	<b>Print Name</b>
<b>Title</b>	<b>Date</b>

<b>Subcontractor Signature</b>	<b>Print Name</b>
<b>Title</b>	<b>Date</b>

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

### Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE<sup>1</sup> subcontractors<sup>2</sup> and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity:			

I have identified potential DBE certified subcontractors	__ YES	__ NO	
If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt	Currently DBE Certified?

\_\_\_\_\_ Continue on back if needed \_\_\_\_\_

<sup>1</sup> A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

<sup>2</sup> Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program  
DBE Subcontractor Utilization Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

<b>Prime Contractor Signature</b>	<b>Print Name</b>
<b>Title</b>	<b>Date</b>

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

## **SUBPART E**

### **Civil Rights Act of 1964**

The contractor and any subcontractors shall not, on the grounds of race, color, or national origin, or sex, exclude from participation in, deny the benefits of, or subject to discrimination any person under any program or activity receiving Federal financial assistance.

## **SUBPART F**

### **Section 13 of PL 92-500; Under the Federal Water Pollution Control Act; Rehabilitation Act of 1973; PL 93-112; and Age Discrimination Act of 1975**

The contractor and any subcontractors shall not on the ground of race, color, national origin, or sex, exclude from participation in, deny the benefits of, or subject to discrimination any person or activity funded in whole or in part with Federal funds. Any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975, or with respect to any otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973 shall also apply to any such program of activity.

## **SUBPART G**

### **Required Provisions of 40 CFR Part 31 Subpart C**

#### **A. Contracts awarded in excess of \$10,000**

##### **1. Equal Employment Opportunity Clause**

- a. The contractor agrees to comply with Executive Order 11246, entitled Equal Employment Opportunity, "as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60).

#### **B. Contracts awarded in Excess of \$100,000**

##### **1. Violating Facilities Clause**

- a. The contractor agrees to comply with all applicable standards, orders or requirements issued under section 306 of the Clean Air Act (42 U.S.C 1857 (h), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and EPA regulations (40 CFR Part 15) which prohibits the award of this contract to facilities included on the EPA List of Violating Facilities. The contractor shall report violations to EPA.

## **SUBPART H**

### **Suspension and Debarment and Other Responsibility Matters**

The Project or Program to which the work covered by this contract pertains to is being assisted by the State of Delaware and the following provision is included in this Contract pursuant to the provisions applicable to such SRF Program. Loan Recipients or engineering representatives are to refer to the “List of parties excluded from Federal Procurement and Nonprocurement Programs” to insure that the contractor or subcontracts are not on this list. A copy of the list may be obtained from the World Wide Web at [www.epls.gov](http://www.epls.gov) or by calling (202) 512-1800 or by writing to this address:

Superintendent of Documents  
U.S. Government Printing Office  
Washington, DC  
20402

### **ACCESS TO PROJECT SITE**

The Contractor shall allow representatives of U.S. EPA and the State of Delaware DNREC access to the project site.

### **PROJECT SIGN**

The contractor shall provide and erect a sign at a prominent location at each construction site. The sign and location shall be approved by the Engineer. The sign shall be prepared in accordance with the attached detailed instructions. It shall be the responsibility of the Contractor to maintain the sign in good condition throughout the life of the project.

The sign wording shown on Figure 1 is an example only and must be adapted to suit each project. The Contractor shall be responsible for obtaining the appropriate wording from the Engineer.

**WORKING FOR YOU TO PROVIDE CLEAN WATER  
FOR TODAY & TOMORROW**

***NAME OF PROJECT***

**PROJECT NO. xxxx-xx**  
Name of Engineering Firm

**FUNDING PROVIDED BY:**

**Funding Source**  
**Funding Source**  
**Funding Source**

**Total Project Costs**

**\$xx,xxx,xxx**  
**\$xx,xxx,xxx**  
**\$xx,xxx,xxx**  
**\$xx,xxx,xxx**

**DIVISION OF WATER RESOURCES**



**CONSTRUCTION SITE SIGN REQUIREMENTS**

Sign Dimensions: 1200 x 2400 x 19 mm (4' x 8' x 3/4") Exterior Plywood (A-B Grade).  
1<sup>st</sup> four lines are 4 inches in height; remaining lines are 2 inches in height.  
DNREC Logo is to be the standard colors – decal to be provided by the Financial Assistance Branch.  
Black letters on white background with 3 inch border around the perimeter in dark blue. Place bottom of sign 36 inches to 48 inches above grade to permit public viewing.  
Provide adequate support for sign.

**EXAMPLE**  
**Figure 1**

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## COMPLIANCE STATEMENT

This statement relates to a proposed contract with \_\_\_\_\_

\_\_\_\_\_  
*(Name of borrower or grantee)*

who expects to finance the contract with assistance from either the Delaware Water Pollution Control Revolving Fund or Delaware 21<sup>st</sup> Century Fund (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the undersigned bidder or prospective contractor, I represent that:

1.  I have,  have not, participated in a previous contract or subcontract subject to Executive Order 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.
2. If I have participated in such a contract or subcontract,  I have,  have not, filed all compliance reports that have been required to file in connection with the contract or subcontract.

If the proposed contract is for \$50,000 or more and I have 50 or more employees, I also represent that:

3.  I have,  have not previously had contracts subject to the written affirmative action programs requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract,  I have,  have not developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to either the DNREC, or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

**NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR  
CERTIFICATIONS OF NON-SEGREGATED FACILITIES**

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, may 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding \$ 10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

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(Signature)

(Date)

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(Name and Title of Signer – Please Type)

## **SECTION 00700 - GENERAL CONDITIONS**

### General Conditions:

The General Conditions of this Contract are as stated in The American Institute of Architects' AIA Document A201 (2007 Edition) entitled General Conditions of the Contract for Construction and is part of this Project Manual as if herein written in full.

Copies of the Document are available through the Owner.

END OF SECTION 00700 – GENERAL CONDITIONS

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## SECTION 00710 - GENERAL REQUIREMENTS

The following GENERAL REQUIREMENTS supplement AIA Document A201 (2007 Edition). In the event of conflict or discrepancies among the Contract Documents, the Documents prepared by the State of Delaware, Division of Parks and Recreation shall take precedence over all other documents.

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### ARTICLE 1: GENERAL PROVISIONS

#### 1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required to an extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.1.2 Work including material purchases shall not begin until the Contractor is in receipt of a bonafide State of Delaware Purchase Order. Any work performed or material purchases prior to the issuance of the Purchase Order is done at the Contractor's own risk and cost.

#### 1.2 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

1.2.1 For Public Works Projects financed in whole or in part by State appropriation, the Contractor agrees that during the performance of this Contract:

- .1 The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sexual orientation, gender identity or national origin. The Contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, color, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following:

employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting Agency setting forth this nondiscrimination clause.

- .2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that “all qualified applicants will receive consideration for employment without regard to race, creed, color, sexual orientation, gender identity, or national origin.”

## **ARTICLE 2: OWNER**

(NO ADDITIONAL GENERAL REQUIREMENTS – SEE SECTION 00800, SUPPLEMENTARY GENERAL CONDITIONS)

## **ARTICLE 3: CONTRACTOR**

- 3.1 Schedule of Values: The successful Bidder shall within twenty (20) days after receiving notice to proceed with the Work, furnish to the Owner a complete schedule of values on the various items comprising the Work.
- 3.2 Subcontracts: Upon approval of Subcontractors, the Contractor shall award their Subcontracts as soon as possible after the signing of their own Contract and see that all material, their own and those of their Subcontractors, are promptly ordered so that the Work will not be delayed by failure of materials to arrive on time.
- 3.3 Before commencing any work or construction, the General Contractor is to consult with the Owner as to matters in connection with access to the site and the allocation of Ground Areas for the various features of hauling, storage, etc.
- 3.4 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions.
- 3.5 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.
- 3.6 The Contractor warrants to the Owner that materials and equipment furnished will be new and of good quality, unless otherwise permitted, and that the Work will be free from defects and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved, may be considered defective. If required by the Owner, the Contractor shall furnish evidence as to the kind and quality of materials and equipment provided.
- 3.7 Unless otherwise provided, the Contractor shall pay all sales, consumer, use and other similar taxes, and shall secure and pay for required permits, fees, licenses, and inspections necessary for proper execution of the Work.
- 3.8 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work. The

Contractor shall promptly notify the Owner if the Drawings and Specifications are observed to be at variance therewith.

- 3.9 The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work under contract with the Contractor.
- 3.10 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project all waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials. The Contractor shall be responsible for returning all damaged areas to their original conditions.
- 3.11 STATE LICENSE AND TAX REQUIREMENTS
  - 3.11.1 In conformance with Chapter 25, Title 30, Section 2502, any person desiring to engage in business in the State of Delaware shall obtain a license upon making application to the Division of Revenue. This license must be obtained and proof of license compliance must be made prior to, or in conjunction with, the execution of a contract to such person. In the case of contracts in excess of \$50,000 which are competitively bid, such person shall have initiated the license application procedure required by this subsection with the Division of Revenue prior to, or in conjunction with, the submission of a bid on a contract, or, in the case of a Subcontractor, prior to the submission of a bid by the General Contractor.
  - 3.11.2 Each Contractor and Subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, the Contractor "shall furnish the Department of Finance within 10 days after entering into any contract with a contractor or subcontractor not a resident of this State, a statement of the total value of such contract or contracts together with the names and addresses of the contracting parties."
  - 3.11.3 The Contractor shall comply with all requirements set forth in Section 6962, Chapter 69, Title 29 of the Delaware Code.

#### **ARTICLE 4: ARCHITECT**

- 4.1 CONTRACT SURETY
  - 4.1.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND
  - 4.1.2 All bonds will be required as follows unless specifically waived elsewhere in the Bidding Documents.
  - 4.1.3 Contents of Performance Bonds – The bond shall be in the form approved by the Office of Management and Budget. The bond shall be conditioned upon the faithful compliance and performance by the successful Bidder of each and every term and condition of the Contract and the proposal, Plans, Specifications, and Bid Documents thereof. Each term and condition shall be met at the time and in the manner prescribed by the Contract, Bid Documents and the Specifications, including the payment in full to every person furnishing materiel or performing labor in the performance of the Contract, of all sums of money due the person for such labor and materiel. (The bond shall also contain the successful bidder's guarantee to indemnify and save harmless the State and the Agency from all costs, damages

and expenses growing out of or by reason of the Contract in accordance with the Contract.)

- 4.1.4 Invoking a Performance Bond – The Agency may, when it considers that the interest of the State so requires, cause judgment to be confessed upon the bond.
- 4.1.5 Within twenty (20) days after the date of notice of award of Contract, the Bidder to whom the award is made shall furnish a Performance Bond and Labor and Material Payment Bond, each equal to the full amount of the Contract price to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable Bonding Company licensed to do business in the State of Delaware and shall be issued in duplicate. In the event a change order is issued which affects total contract price issued, the Contractor shall notify the Surety of the change in contract price and shall show proof of approval to the Agency.
- 4.1.6 Performance and Payment Bonds shall be maintained in full force (warranty bond) for a period of two (2) years after the date of the Certificate for Final Payment. The Performance Bond shall guarantee the satisfactory completion of the Project and that the Contractor will make good any faults or defects in his Work which may develop during the period of said guarantees as a result of improper or defective workmanship, material or apparatus, whether furnished by themselves or their Sub-Contractors. The Payment Bond shall guarantee that the Contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and material for, or on account of, the work included herein. The bonds shall be paid for by this Contractor. The Owner shall have the right to demand proof that the parties signing the bonds are duly authorized to do so.

#### 4.2 FAILURE TO COMPLY WITH CONTRACT

- 4.2.1 If any firm entering into a contract with the State, or Agency neglects or refuses to perform or fails to comply with the terms thereof, the Agency which signed the Contract may terminate the Contract and proceed to award a new contract in accordance with Chapter 69, Title 29 of the Delaware Code or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond. Nothing herein shall preclude the Agency from pursuing additional remedies as otherwise provided by law.

#### 4.3 CONTRACT INSURANCE AND CONTRACT LIABILITY

- 4.3.1 In addition to the bond requirements stated in the Bid Documents, each successful Bidder shall purchase adequate insurance for the performance of the Contract and, by submission of a Bid, agrees to indemnify and save harmless and to defend all legal or equitable actions brought against the State, any Agency, officer and/or employee of the State, for and from all claims of liability which is or may be the result of the successful Bidder's actions during the performance of the Contract.
- 4.3.2 The purchase or nonpurchase of such insurance or the involvement of the successful Bidder in any legal or equitable defense of any action brought against the successful Bidder based upon work performed pursuant to the Contract will not waive any defense which the State, its agencies and their respective officers, employees and agents might otherwise have against such claims, specifically including the defense of sovereign immunity, where applicable, and by the terms of this section, the State and all agencies, officers and employees thereof shall not be

financially responsible for the consequences of work performed, pursuant to said contract.

#### 4.4 RIGHT TO AUDIT RECORDS

4.4.1 The Owner shall have the right to audit the books and records of a Contractor or any Subcontractor under any Contract or Subcontract to the extent that the books and records relate to the performance of the Contract or Subcontract.

4.4.2 Said books and records shall be maintained by the Contractor for a period of seven (7) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of seven (7) years from the date of final payment under the Subcontract.

### ARTICLE 5: SUBCONTRACTORS

#### 5.1 SUBCONTRACTING REQUIREMENTS

5.1.1 All contracts for the construction, reconstruction, alteration or repair of any public building (not a road, street or highway) shall be subject to the following provisions:

.1 A contract shall be awarded only to a Bidder whose Bid is accompanied by a statement containing, for each Subcontractor category, the name and address (city or town and State only – street number and P.O. Box addresses not required) of the Subcontractor whose services the Bidder intends to use in performing the Work and providing the material for such Subcontractor category.

.2 A Bid will not be accepted nor will an award of any Contract be made to any Bidder which, as the Prime Contractor, has listed itself as the Subcontractor for any Subcontractor unless:

.1 It has been established to the satisfaction of the awarding Agency that the Bidder has customarily performed the specialty work of such Subcontractor category by artisans regularly employed by the Bidder's firm;

.2 That the Bidder is duly licensed by the State to engage in such specialty work, if the State requires licenses; and

.3 That the Bidder is recognized in the industry as a bona fide Subcontractor or Contractor in such specialty work and Subcontractor category.

5.1.2 The decision of the awarding Agency as to whether a Bidder who lists itself as the Subcontractor for a Subcontractor category shall be final and binding upon all Bidders, and no action of any nature shall lie against any awarding Agency or its employees or officers because of its decision in this regard.

5.1.3 After such a Contract has been awarded, the successful Bidder shall not substitute another Subcontractor for any Subcontractor whose name was set forth in the statement which accompanied the Bid without the written consent of the awarding Agency.

5.1.4 No Agency shall consent to any substitution of Subcontractors unless the Agency is satisfied that the Subcontractor whose name is on the Bidders accompanying statement:

- .1 Is unqualified to perform the work required;
- .2 Has failed to execute a timely reasonable Subcontract;
- .3 Has defaulted in the performance on the portion of the work covered by the Subcontract; or
- .4 Is no longer engaged in such business.

## 5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.2.1 Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount\*). The Agency may determine to deduct payments of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All penalty amounts assessed and not refunded or remitted to the Contractor shall be reverted to the State.

\*one (1) percent of contract amount not to exceed \$10,000

## 5.3 ASBESTOS ABATEMENT

5.3.1 The selection of any Contractor to perform asbestos abatement for State-funded projects shall be approved by the Office of Management and Budget, Division of Facilities Management pursuant to Chapter 78 of Title 16.

## 5.4 STANDARDS OF CONSTRUCTION FOR THE PROTECTION OF THE PHYSICALLY HANDICAPPED

5.4.1 All Contracts shall conform with the standard established by the Delaware Architectural Accessibility Board unless otherwise exempted by the Board.

## 5.5 CONTRACT PERFORMANCE

5.5.1 If any firm entering into a Public Works Contract neglects or refuses to perform or fails to comply with its terms, the Agency may terminate the Contract and proceed to award a new Contract or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond.

## **ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

6.1 The Owner reserves the right to simultaneously perform other construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other projects at the same site.

- 6.2 The Contractor shall afford the Owner and other Contractors reasonable opportunity for access and storage of materials and equipment, and for the performance of their activities, and shall connect and coordinate their activities with other forces as required by the Contract Documents.

**ARTICLE 7: CHANGES IN THE WORK**

- 7.1 The Owner, without invalidating the Contract, may order changes in the Work consisting of Additions, Deletions, Modifications or Substitutions, with the Contract Sum and Contract completion date being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Architect, as the duly authorized agent, the Contractor and the Owner.
- 7.2 The Contract Sum and Contract Completion Date shall be adjusted only by a fully executed Change Order.
- 7.3 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor and the Architect. In all cases, this cost or credit shall be based on the 'DPE' wages required and the "invoice price" of the materials/equipment needed.
- 7.3.1 "DPE" shall be defined to mean "direct personnel expense". Direct payroll expense includes direct salary plus customary fringe benefits (prevailing wage rates) and documented statutory costs such as workman's compensation insurance, Social Security/Medicare, and unemployment insurance (a maximum multiplier of 1.35 times DPE).
- 7.3.2 "Invoice price" of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor, (or subcontractor), to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity. Rates for equipment that is leased and/or owned by the Contractor or subcontractor(s) shall not exceed those listed in the latest version of the "Means Building Construction Cost Data" publication.
- 7.3.3 In addition to the above, the General Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the General Contractor's own forces. For additional subcontractor work, the Subcontractor is allowed a fifteen (15) percent overhead and profit on Change Order work above and beyond the direct costs stated previously. To this amount, the General Contractor will be allowed a mark-up not exceeding seven and one half percent (7.5%) on the subcontractors work. These mark-ups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc. No markup is permitted on the work of the subcontractor's subcontractor. No additional costs shall be allowed for changes related to the Contractor's onsite superintendent/staff, or project manager, unless a change in the work changes the project duration and is identified by the CPM schedule. There will be no other costs associated with the Change Order.
- 7.3.4 Additional work performed by the Contractor without authorization of a Change Order will not entitle him to an increase in the Contract Price or an extension of the Contract Time, except for emergencies as outlined in AIA Document A201, Paragraph 10.4 EMERGENCIES.

**ARTICLE 8: TIME**

- 8.1 Time limits, if any, are as stated in the Project Manual. By executing the Agreement, the Contractor confirms that the stipulated limits are reasonable, and that the Work will be completed within the anticipated time frame.
- 8.2 If progress of the Work is delayed at any time by changes ordered by the Owner, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be extended for such reasonable time as the Owner may determine.
- 8.3 Any extension of time beyond the date fixed for completion of the construction and acceptance of any part of the Work called for by the Contract, or the occupancy of the building by the Owner, in whole or in part, previous to the completion shall not be deemed a waiver by the Owner of his right to annul or terminate the Contract for abandonment or delay in the matter provided for, nor relieve the Contractor of full responsibility.
- 8.4 SUSPENSION AND DEBARMENT
- 8.4.1 Per Section 6962(d)(14), Title 29, Delaware Code, "Any Contractor who fails to perform a Public Works Contract or complete a Public Works Project within the time schedule established by the Agency in the invitation to bid, may be subject to Suspension or Debarment for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the Project."
- 8.4.2 Upon such failure for any of the above stated reasons, the Agency that contracted for the Public Works Project may petition the Director of the Office of Management and Budget for Suspension or Debarment of the Contractor. The Agency shall send a copy of the petition to the Contractor within three (3) working days of filing with the Director. If the Director concludes that the petition has merit, the Director shall schedule and hold a hearing to determine whether to suspend the Contractor, debar the Contractor or deny the petition. The Agency shall have the burden of proving, by a preponderance of the evidence, that the Contractor failed to perform or complete the Public Works Project within the time schedule established by the Agency and failed to do so for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the project. Upon a finding in favor of the Agency, the Director may suspend a Contractor from Bidding on any project funded, in whole or in part, with public funds for up to 1 year for a first offense, up to 3 years for a second offense and permanently debar the Contractor for a third offense. The Director shall issue a written decision and shall send a copy to the Contractor and the Agency. Such decision may be appealed to the Superior Court within thirty (30) days for a review on the record.
- 8.5 RETAINAGE
- 8.5.1 Per Section 6962(d)(5), Title 29, Delaware Code: The Agency may at the beginning of each Public Works Project establish a time schedule for the completion of the project. If the project is delayed beyond the completion date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.
- 8.5.2 This forfeiture of retainage also applies to the timely completion of the punchlist. A punchlist will only be prepared upon the mutual agreement of the Owner, Architect

and Contractor. Once the punchlist is prepared, all three parties will by mutual agreement, establish a schedule for its completion. Should completion of the punchlist be delayed beyond the established date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.

## **ARTICLE 9: PAYMENTS AND COMPLETION**

### **9.1 APPLICATION FOR PAYMENT**

9.1.1 Applications for payment shall be made upon AIA Document G702.

9.1.2 A date will be fixed for the taking of the monthly account of work done. Upon receipt of Contractor's itemized application for payment, such application will be audited, modified, if found necessary, and approved for the amount. Statement shall be submitted to the Owner.

9.1.3 Section 6516, Title 29 of the Delaware Code annualized interest is not to exceed 12% per annum beginning thirty (30) days after the "presentment" (as opposed to the date) of the invoice.

### **9.2 PARTIAL PAYMENTS**

9.2.1 Any Public Works Contract executed by any Agency may provide for partial payments at the option of the Owner with respect to materials placed along or upon the sites or stored at secured locations, which are suitable for use in the performance of the Contract.

9.2.2 When approved by the Agency, partial payment may include the values of tested and acceptable materials of a nonperishable or noncontaminative nature which have been produced or furnished for incorporation as a permanent part of the Work yet to be completed, provided acceptable provisions have been made for storage.

.1 Any allowance made for materials on hand will not exceed the delivered cost of the materials as verified by invoices furnished by the Contractor, nor will it exceed the contract bid price for the material complete in place.

9.2.3 If requested by the Agency, receipted bills from all Contractors, Subcontractors, and materialmen, etc., for the previous payment must accompany each application for payment. Following such a request, no payment will be made until these receipted bills have been received by the Owner.

### **9.3 SUBSTANTIAL COMPLETION**

9.3.1 When the building has been made suitable for occupancy, but still requires small items of miscellaneous work, the Owner will determine the date when the Project has been Substantially Completed. When site utilities have been completed to the extent that they are functional and can be utilized by the Owner in accordance with the intent of the Contract Documents, the Owner will determine the date when the Project has been Substantially Completed.

.1 Substantial Completion for this Project includes the completion of pipe and lateral replacement and spot repairs, proper abandonment of indicated sewer infrastructure, specified manhole restoration/replacements, and roadway restoration.

9.3.2 If, after the Work has been Substantially Completed, full completion thereof is materially delayed through no fault of the Contractor, and without terminating the Contract, the Owner may make payment of the balance due for the portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.3.3 On projects where commissioning is included, the commissioning work as defined in the specifications must be complete prior to the issuance of Substantial Completion.

#### 9.4 FINAL PAYMENT

9.4.1 Final payment, including the retainage if determined appropriate, shall be made within thirty (30) days after the Work is fully completed and the Contract fully performed and provided that the Contractor has submitted the following closeout documentation (in addition to any other documentation required elsewhere in the Contract Documents):

- .1 Evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the Work have been paid,
- .2 An acceptable RELEASE OF LIENS,
- .3 Copies of all applicable warranties,
- .4 As-built drawings,
- .5 Operations and Maintenance Manuals,
- .6 Instruction Manuals,
- .7 Consent of Surety to final payment.
- .8 The Owner reserves the right to retain payments, or parts thereof, for its protection until the foregoing conditions have been complied with, defective work corrected and all unsatisfactory conditions remedied.

#### **ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY**

10.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take all reasonable precautions to prevent damage, injury or loss to: workers, persons nearby who may be affected, the Work, materials and equipment to be incorporated, and existing property at the site or adjacent thereto. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on the safety of persons and property and their protection from injury, damage, or loss. The Contractor shall promptly remedy damage and loss to property at the site caused in whole or in part by the Contractor, a Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

10.2 The Contractor shall notify the Owner in the event any existing hazardous material such as lead, PCBs, asbestos, etc. is encountered on the project. The Owner will arrange with a qualified specialist for the identification, testing, removal, handling and protection against

exposure or environmental pollution, to comply with applicable regulation laws and ordinances. The Contractor and Architect will not be required to participate in or to perform this operation. Upon completion of this work, the Owner will notify the Contractor and Architect in writing the area has been cleared and approved by the authorities in order for the work to proceed. The Contractor shall attach documentation from the authorities of said approval.

- 10.3 As required in the Hazardous Chemical Information Act of June 1984, all vendors supplying any materials that may be defined as hazardous, must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a warning caution on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in any foreseeable emergency situation. Material Safety Data Sheets must be provided directly to the Owner along with the shipping slips that include those products.
- 10.4 The Contractor shall certify to the Owner that materials incorporated into the Work are free of all asbestos. This certification may be in the form of Material Safety Data Sheet (MSDS) provided by the product manufacturer for the materials used in construction, as specified or as provided by the Contractor.

#### **ARTICLE 11: INSURANCE AND BONDS**

- 11.1 The Contractor shall carry all insurance required by law, such as Unemployment Insurance, etc. The Contractor shall carry such insurance coverage as they desire on their own property such as a field office, storage sheds or other structures erected upon the project site that belong to them and for their own use. The Subcontractors involved with this project shall carry whatever insurance protection they consider necessary to cover the loss of any of their personal property, etc.
- 11.2 Upon being awarded the Contract, the Contractor shall obtain a minimum of two (2) copies of all required insurance certificates called for herein, and submit one (1) copy of each certificate, to the Owner, within 20 days of contract award.
- 11.3 Bodily Injury Liability and Property Damage Liability Insurance shall, in addition to the coverage included herein, include coverage for injury to or destruction of any property arising out of the collapse of or structural injury to any building or structure due to demolition work and evidence of these coverages shall be filed with and approved by the Owner.
- 11.4 The Contractor's Property Damage Liability Insurance shall, in addition to the coverage noted herein, include coverage on all real and personal property in their care, custody and control damaged in any way by the Contractor or their Subcontractors during the entire construction period on this Project.
- 11.5 Builders Risk (including Standard Extended Coverage Insurance) on the existing building during the entire construction period, shall not be provided by the Contractor under this Contract. The Owner shall insure the existing building and all of its contents and all this new alteration work under this Contract during entire construction period for the full insurable value of the entire work at the site. Note, however, that the Contractor and their Subcontractors shall be responsible for insuring building materials (installed and stored) and their tools and equipment whenever in use on the project, against fire damage, theft, vandalism, etc.

11.6 Certificates of the insurance company or companies stating the amount and type of coverage, terms of policies, etc., shall be furnished to the Owner, within 20 days of contract award.

11.7 The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

11.7.1 Contractor's Contractual Liability Insurance

Minimum coverage to be:

Bodily Injury	\$ 500,000	for each person
	\$1,000,000	for each occurrence
	\$1,000,000	aggregate
Property Damage	\$ 500,000	for each occurrence
	\$1,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury	\$ 500,000	for each person
	\$1,000,000	for each occurrence
	\$1,000,000	aggregate
Property Damage	\$ 500,000	for each occurrence
	\$ 500,000	aggregate

11.7.3 Automobile Liability Insurance

Minimum coverage to be:

Bodily Injury	\$1,000,000	for each person
	\$1,000,000	for each occurrence
Property Damage	\$ 500,000	per accident

11.7.4 Prime Contractor's and Subcontractors' policies shall include contingent and contractual liability coverage in the same minimum amounts as 11.7.1 above.

11.7.5 Workmen's Compensation (including Employer's Liability):

- .1 Minimum Limit on employer's liability to be as required by law.
- .2 Minimum Limit for all employees working at one site.

11.7.6 Certificates of Insurance must be filed with the Owner guaranteeing fifteen (15) days prior notice of cancellation, non-renewal, or any change in coverages and limits of liability shown as included on certificates.

11.7.7 Social Security Liability

- .1 With respect to all persons at any time employed by or on the payroll of the Contractor or performing any work for or on their behalf, or in connection with or arising out of the Contractor's business, the Contractor shall accept full and

exclusive liability for the payment of any and all contributions or taxes or unemployment insurance, or old age retirement benefits, pensions or annuities now or hereafter imposed by the Government of the United States and the State or political subdivision thereof, whether the same be measured by wages, salaries or other remuneration paid to such persons or otherwise.

- .2 Upon request, the Contractor shall furnish Owner such information on payrolls or employment records as may be necessary to enable it to fully comply with the law imposing the aforesaid contributions or taxes.
- .3 If the Owner is required by law to and does pay any and/or all of the aforesaid contributions or taxes, the Contractor shall forthwith reimburse the Owner for the entire amount so paid by the Owner.

#### **ARTICLE 12: UNCOVERING AND CORRECTION OF WORK**

- 12.1 The Contractor shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements of the Contract Documents within a period of two years from the date of Substantial Completion, or by terms of an applicable special warranty required by the Contract Documents. The provisions of this Article apply to work done by Subcontractors as well as to Work done by direct employees of the Contractor.
- 12.2 At any time during the progress of the Work, or in any case where the nature of the defects shall be such that it is not expedient to have them corrected, the Owner, at their option, shall have the right to deduct such sum, or sums, of money from the amount of the Contract as they consider justified to adjust the difference in value between the defective work and that required under Contract including any damage to the structure.

#### **ARTICLE 13: MISCELLANEOUS PROVISIONS**

##### **13.1 CUTTING AND PATCHING**

- 13.1.1 The Contractor shall be responsible for all cutting and patching. The Contractor shall coordinate the work of the various trades involved.

##### **13.2 DIMENSIONS**

- 13.2.1 All dimensions shown shall be verified by the Contractor by actual measurements at the Project site. Any discrepancies between the Drawings and Specifications and the existing conditions shall be referred to the Owner for adjustment before any work affected thereby has been performed.

##### **13.3 LABORATORY TESTS**

- 13.3.1 Any specified laboratory tests of material and finished articles to be incorporated in the Work shall be made by bureaus, laboratories or agencies approved by the Owner and reports of such tests shall be submitted to the Owner. The cost of the testing shall be paid for by the Contractor.
- 13.3.2 The Contractor shall furnish all sample materials required for these tests and shall deliver same without charge to the testing laboratory or other designated agency when and where directed by the Owner.

13.4 ARCHAEOLOGICAL EVIDENCE

13.4.1 Whenever in the course of construction any archaeological evidence is encountered on the surface or below the surface of the ground, the Contractor shall notify the Owner and the authorities of the State Historic Preservation Office and suspend work in the immediate area for a reasonable time to permit those authorities or persons designated by the Owner, to ascertain its historic and cultural significance and to determine the need for compliance with the relevant State and Federal law and policies.

13.5 GLASS REPLACEMENT AND CLEANING

13.5.1 The General Contractor shall replace without expense to the Owner all glass broken during the construction of the project. If job conditions warrant, at completion of the job the General Contractor shall have all glass cleaned and polished.

13.6 WARRANTY

13.6.1 For a period of two (2) years from the date of Substantial Completion, as evidenced by the date of final acceptance of the work, the Contractor warrants that work performed under this Contract conforms to the Contract requirements and is free of any defect of equipment, material or workmanship performed by the Contractor or any of his subcontractors or suppliers. However, manufacturer's warranties and guarantees, if for a period longer than two (2) years, shall take precedence over the above warranties. The Contractor shall remedy, at his own expense, any such failure to conform or any such defect. The protection of this warranty shall be included in the Contractor's Performance Bond.

**ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT**

14.1 If the Contractor defaults or persistently fails or neglects to carry out the Work in accordance with the Contract Documents or fails to perform a provision of the Contract, the Owner, after seven days written notice to the Contractor, may make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. Alternatively, at the Owner's option, and the Owner may terminate the Contract and take possession of the site and of all materials, equipment, tools, and machinery thereon owned by the Contractor and may finish the Work by whatever method the Owner may deem expedient. If the costs of finishing the Work exceed any unpaid compensation due the Contractor, the Contractor shall pay the difference to the Owner.

14.2 If the continuation of this Agreement is contingent upon the appropriation of adequate State, or federal funds, this Agreement may be terminated on the date beginning on the first fiscal year for which funds are not appropriated or at the exhaustion of the appropriation. The Owner may terminate this Agreement by providing written notice to the parties of such non-appropriation. All payment obligations of the Owner will cease upon the date of termination. Notwithstanding the foregoing, the Owner agrees that it will use its best efforts to obtain approval of necessary funds to continue the Agreement by taking appropriate action to request adequate funds to continue the Agreement.

END OF SECTION 00710 - GENERAL REQUIREMENTS

## SECTION 00800 - SUPPLEMENTARY GENERAL CONDITIONS

The following supplements modify the “General Conditions of the Contract for Construction,” AIA Document A201-2007. Where a portion of the General Conditions is modified or deleted by the Supplementary General Conditions, the unaltered portions of the General Conditions shall remain in effect.

### TABLE OF ARTICLES

1. GENERAL PROVISIONS
2. OWNER
3. CONTRACTOR
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### ARTICLE 1: GENERAL PROVISIONS

#### 1.1 BASIC DEFINITIONS

##### 1.1.1 THE CONTRACT DOCUMENTS

Delete the last sentence in its entirety and replace with the following:

“The Contract Documents also include Advertisement for Bid, Instructions to Bidders, sample forms, the Bid Form, the Contractor’s completed Bid and the Award Letter.”

Add the following clause:

- 1.1.1.1 In the event of conflict or discrepancies among the Contract Documents, the Documents prepared by the State of Delaware, Division of Parks and Recreation shall take precedence over all other documents.

#### 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following subparagraphs:

- 1.2.4 In the case of an inconsistency between the Drawings and the Specifications, or within either document not clarified by Addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect’s interpretation.

1.2.5 The word “PROVIDE” as used in the Contract Documents shall mean “FURNISH AND INSTALL” and shall include, without limitation, all labor, materials, equipment, transportation, services and other items required to complete the Work.

1.2.6 The word “PRODUCT” as used in the Contract Documents means all materials, systems and equipment.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

Delete subparagraph 1.5.1 in its entirety and replace with the following:

“All pre-design studies, drawings, specifications and other documents, including those in electronic form, prepared by the Architect under this Agreement are, and shall remain, the property of the Owner whether the Project for which they are made is executed or not. Such documents may be used by the Owner to construct one or more like Projects without the approval of, or additional compensation to, the Architect. The Contractor, Subcontractors, Sub-subcontractors and Material or Equipment Suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect’s consultants appropriate to and for use in the execution of their Work under the Contract Documents. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or Material and Equipment Supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and Architect’s consultants.

The Architect shall not be liable for injury or damage resulting from the re-use of drawings and specifications if the Architect is not involved in the re-use project. Prior to re-use of construction documents for a project in which the Architect is not also involved, the Owner will remove from such documents all identification of the original Architect, including name, address and professional seal or stamp.”

Delete subparagraph 1.5.2 in its entirety.

**ARTICLE 2: OWNER**

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

To subparagraph 2.2.3 – Add the following sentence:

“The Contractor, at their expense shall bear the costs to accurately identify the location of all underground utilities in the area of their excavation and shall bear all cost for any repairs required, out of failure to accurately identify said utilities.”

Delete subparagraph 2.2.5 in its entirety and substitute the following:

2.2.5 The Contractor will be furnished, free of charge, a specified number of copies of Drawings and Project Manuals. Refer to Section 01005, ADMINISTRATIVE PROVISIONS. Additional sets will be furnished at the cost of reproduction, postage and handling.

**ARTICLE 3: CONTRACTOR**

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

Amend subparagraph 3.2.2 to state that any errors, inconsistencies or omissions discovered shall be reported to the Architect and Owner immediately.

Delete the third sentence in subparagraph 3.2.4.

### 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following clause to subparagraph 3.3.2:

3.3.2.1 The Contractor shall immediately remove from the Work, whenever requested to do so by the Owner, any person who is considered by the Owner or Architect to be incompetent or disposed to be so disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or the Architect.

Add the following subparagraphs:

3.3.4 The Contractor must provide suitable storage facilities at the Site for the proper protection and safe storage of their materials. Consult the Owner and the Architect before storing any materials.

3.3.5 When any room is used as a shop, storeroom, office, etc., by the Contractor or Subcontractor(s) during the construction of the Work, the Contractor making use of these areas will be held responsible for any repairs, patching or cleaning arising from such use.

### 3.4 LABOR AND MATERIALS

Add the following subparagraphs:

3.4.4 Before starting the Work, each Contractor, or Subcontractor, shall carefully examine all preparatory Work that has been executed to receive their Work. Check carefully, by whatever means are required, to insure that its Work and adjacent, related Work, will finish to proper contours, planes and levels. Promptly notify the General Contractor/Construction Manager of any defects or imperfections in preparatory Work which will in any way affect satisfactory completion of its Work. Absence of such notification will be construed as an acceptance of preparatory Work and later claims of defects will not be recognized.

3.4.5 Under no circumstances shall the Contractor's Work proceed prior to preparatory Work having been completely cured, dried and/or otherwise made satisfactory to receive this Work. Responsibility for timely installation of all materials rests solely with the Contractor responsible for that Work, who shall maintain coordination at all times.

### 3.5 WARRANTY

Add the following subparagraphs:

3.5.1 The Contractor will guarantee all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for two years after Acceptance by the Owner, and will maintain all items in perfect condition during the period of guarantee.

- 3.5.2 Defects appearing during the period of guarantee will be made good by the Contractor at his expense upon demand of the Owner, it being required that all Work will be in perfect condition when the period of guarantee will have elapsed.
- 3.5.3 In addition to the General Guarantee there are other guarantees required for certain items for different periods of time than the two years as above, and are particularly so stated in that part of the specifications referring to same. The said guarantees will commence at the same time as the General Guarantee.
- 3.5.4 If the Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the Owner will have the right to replace, repair, or otherwise remedy the failure, defect or damage at the expense of the Contractor and/or his surety.

### 3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following subparagraphs:

- 3.11.1 During the course of the Work, the Contractor shall maintain a record set of drawings on which the Contractor shall mark the actual physical location of all piping, valves, equipment, conduit, outlets, access panels, controls, actuators, including all appurtenances that will be concealed once construction is complete, etc., including all invert elevations.
- 3.11.2 At the completion of the Project, the Contractor shall obtain a set of reproducible drawings from the Architect, and neatly transfer all information outlined in 3.11.1 to provide a complete record of the as-built conditions.
- 3.11.3 The Contractor shall provide two (2) prints of the as-built conditions, along with the reproducible drawings themselves, to the Owner and one (1) set to the Architect. In addition, attach one complete set to each of the Operating and Maintenance Instructions/Manuals.

### 3.13 USE OF SITE

Add the following new subparagraphs:

- 3.13.1 The Contractor will not load nor permit any part of the structure to be loaded with weight that will endanger the structure.
- 3.13.2 Storage areas will be defined for the storage of the Contractor's materials and equipment and he shall confine his materials, equipment, and operations of his workmen to such limits as indicated by the Owner. Unless otherwise indicated in the Specifications, the storage areas will be outdoors, and the contractor shall provide whatever shelter is necessary for his storage and fabricating needs. No workmen shall trespass within areas or buildings of the Owner other than those related to the Work of the Contract. The Contractor shall rigidly enforce this regulation. Any materials, equipment or temporary structures belonging to the Contractor shall be moved when so directed by the Owner to permit the execution of the work of others in connection with the Project.

### 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

In the second sentence of the paragraph, insert "indemnify and" between "shall" and "hold".

**ARTICLE 4: ARCHITECT**

4.2 ADMINISTRATION OF THE CONTRACT

Delete the first sentence of subparagraph 4.2.7 and replace with the following:

The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents.

Delete the second sentence of subparagraph 4.2.7 and replace with the following:

The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate Contractors, while allowing sufficient time in the Owner's professional judgment to permit adequate review.

Add the following clause to subparagraph 4.2.10:

4.2.10.1 There will be no full-time project representative provided by the Owner or Architect on this project.

Add to subparagraph 4.2.13 "and in compliance with all local requirements." to the end of the sentence.

**ARTICLE 5: SUBCONTRACTORS**

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

Delete subparagraph 5.2.3 in its entirety and replace with the following:

5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection, subject to the statutory requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4.

**ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

Delete Paragraph 6.1.4 in its entirety.

6.2 MUTUAL RESPONSIBILITY

6.2.3 In the second sentence, strike the word "shall" and insert the word "may".

Add the following Paragraph to Article 6:

6.4 DEPARTMENT FURNISHED MATERIALS AND EQUIPMENT

6.4.1 If any materials or equipment are to be furnished by the Owner for the Work, they will be so specified in the Contract Documents. Unless otherwise specified, it shall be the Contractor's responsibility to locate, receive, handle and store, if necessary, any item of Owner furnished material or equipment which he is required by the

Contract to install, erect or handle in any way, from the time it is received by the Contractor at the jobsite or other Owner approved location until completion of the Work in accordance with the Contract Documents. Damaged or lost Owner furnished items shall be repaired or replaced by the Contractor without additional cost to the Owner. See Section 01005, ADMINISTRATIVE PROVISIONS for list of Owner furnished materials and equipment.

**ARTICLE 7: CHANGES IN THE WORK**

(SEE ARTICLE 7: CHANGES IN WORK IN THE GENERAL REQUIREMENTS)

**ARTICLE 8: TIME**

8.2 PROGRESS AND COMPLETION

Add the following clause to subparagraph 8.2.1:

8.2.1.1 Refer to Specification Section 01005, ADMINISTRATIVE PROVISIONS for Contract time requirements.

Add the following new subparagraph:

8.2.4 If the Work falls behind the Progress Schedule as submitted by the Contractor, the Contractor shall employ additional labor and/or equipment necessary to bring the Work into compliance with the Progress Schedule at no additional cost to the Owner.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 Strike “arbitration” and insert “remedies at law or in equity”.

Add the following clause to subparagraph 8.3.2:

8.3.2.1 The Contractor shall update the status of the suspension, delay, or interruption of the Work with each Application for Payment. (The Contractor shall report the termination of such cause immediately upon the termination thereof.) Failure to comply with this procedure shall constitute a waiver for any claim for adjustment of time or price based upon said cause.

Delete subparagraph 8.3.3 in its entirety and replace with the following:

8.3.3 Except in the case of a suspension of the Work directed by the Owner, an extension of time under the provisions of Paragraph 8.3.1 shall be the Contractor’s sole remedy in the progress of the Work and there shall be no payment or compensation to the Contractor for any expense or damage resulting from the delay.

Add the following subparagraph:

8.3.4 By permitting the Contractor to work after the expired time for completion of the Project, the Owner does not waive their rights under the Contract.

**ARTICLE 9: PAYMENTS AND COMPLETION**

9.2 SCHEDULE OF VALUES

Add the following subparagraphs:

- 9.2.1 The Schedule of Values shall be submitted using AIA Document G703, Continuation Sheet to G702.
- 9.2.2 The Schedule of Values is to include a line item for Project Closeout Document Submittal. The value of this item is to be no less than 1% of the initial contract amount.

9.3 APPLICATIONS FOR PAYMENT

Add the following clause to subparagraph 9.3.1:

- 9.3.1.3 Application for Payment shall be submitted on AIA Document G702 “Application and Certificate for Payment”, supported by AIA Document G703 “Continuation Sheet”. Said Applications shall be fully executed and notarized.

Add the following subparagraphs:

- 9.3.4 Until the Work is 90% complete, the owner will pay 95% of the value of completed Work, based on the Contract prices of labor and materials incorporated in the Work and of materials suitably stored at the site thereof up to the last day of the preceding month as estimated by the Architect, less the aggregate of previous payments. At the time the Work is 90% complete, if the manner of completion of the Work and its progress are and remain satisfactory to the Architect, and in the absence of other good and sufficient reasons, as provided in GENERAL REQUIREMENTS 8.5 RETAINAGE, the Architect shall, on presentation by the Contractor of Consent of Surety, certify for payment to the Contractor half the funds being held as retainage by the Owner. Thereafter, the Owner will pay 97.5% of the amount due the Contractor on account of remaining progress payments.
- 9.3.5 The Contractor shall provide a current and updated Progress Schedule to the Architect with each Application for Payment. Failure to provide Schedule will be just cause for rejection of Application for Payment.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add the following clauses to subparagraph 9.5.1:

- .8 failure to provide a current Progress Schedule;
- .9 a lien or attachment is filed;
- .10 failure to comply with mandatory requirements for maintaining Record Documents.

9.6 PROGRESS PAYMENTS

Delete subparagraph 9.6.1 in its entirety and replace with the following:

- 9.6.1 After the Architect has approved and issued a Certificate for Payment, payment shall be made by the Owner within 30 days after Owner’s receipt of the Certificate for Payment.

#### 9.7 FAILURE OF PAYMENT

In first sentence, strike “seven” and insert “thirty (30)”. Also strike “binding dispute resolution” and insert “remedies at law or in equity”.

#### 9.8 SUBSTANTIAL COMPLETION

Add the following sentence to Subparagraph 9.8.3:

“If the Architect is required to make more than 2 inspections of the same portion of Work, the Contractor shall be responsible for all costs associated with subsequent inspections including but not limited to any Architect’s fees.”

9.8.5 In the second sentence, strike “shall” and insert “may”.

### **ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY**

#### 10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following subparagraphs:

10.1.1 Each Contractor shall develop a Safety Program in accordance with the Occupational Safety and Health Act of 1970. A copy of said plan shall be furnished to the Owner and Architect prior to the commencement of that Contractor’s Work.

10.1.2 Each Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full time basis. If deemed necessary by the Owner or Architect, Contractor Safety Meetings will be scheduled. The attendance of all Safety Representatives will be required. Minutes will be recorded of said meetings by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

#### 10.3 HAZARDOUS MATERIALS

Delete subparagraph 10.3.3 in its entirety.

Delete subparagraph 10.3.6 in its entirety.

### **ARTICLE 11: INSURANCE AND BONDS**

#### 11.1 CONTRACTOR’S LIABILITY INSURANCE

11.1.4 Strike “the Owner” immediately following “(1)” and strike “and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s completed operations.”

#### 11.2 OWNER’S LIABILITY INSURANCE

Delete Paragraph 11.2 in its entirety.

#### 11.3 PROPERTY INSURANCE

Delete Paragraph 11.3 in its entirety and replace with the following:

11.3 The State will not provide Builder's All Risk Insurance for the Project. The Contractor and all Subcontractors shall provide property coverage for their tools and equipment, as necessary. Any mandatory deductible required by the Contractor's Insurance shall be the responsibility of the Contractor.

11.4 PERFORMANCE BOND AND PAYMENT BOND

Add the following sentence to subparagraph 11.4.1:

"The bonds will conform to those forms approved by the Office of Management and Budget."

**ARTICLE 12: UNCOVERING AND CORRECTION OF WORK**

12.2 CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 Strike "one year" and insert "two years".  
Strike "one-year" and insert "two-year".

Add the following subclause to clause 12.2.2.1:

12.2.2.1.1 At any time during the progress of the Work, or in any case where the nature of the defects will be such that it is not expedient to have corrected, the Owner, at its option, will have the right to deduct such sum, or sums, of money from the amount of the Contract as it considers justified to adjust the difference in value between the defective work and that required under Contract including any damage to the structure.

12.2.2.2 Strike "one" and insert "two".

12.2.2.3 Strike "one" and insert "two".

12.2.5 In second sentence, strike "one" and insert "two".

**ARTICLE 13: MISCELLANEOUS PROVISIONS**

13.1 GOVERNING LAW

Strike "except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4."

13.6 INTEREST

Strike "the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located." Insert "30 days of presentment of the authorized Certificate of Payment at the annual rate of 12% or 1% per month.

13.7 TIME LIMITS ON CLAIMS

Strike the last sentence.

Add the following Paragraph:

13.8 CONFLICTS WITH FEDERAL STATUTES OR REGULATIONS

- 13.8.1 If any provision, specifications or requirement of the Contract Documents conflict or is inconsistent with any statute, law or regulation of the government of the United State of America, the Contractor shall notify the Architect and Owner immediately upon discovery.

**ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT**

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

Delete subparagraph 14.4.3 in its entirety and replace with the following:

- 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and cost incurred by reason of such termination along with reasonable overhead.

**ARTICLE 15: CLAIMS AND DISPUTES**

15.1 CLAIMS

- 15.1.2 Throughout the Paragraph strike "21" and insert "45".

Delete subparagraph 15.1.6 in its entirety.

15.2 INITIAL DECISION

Delete subparagraph 15.2.5 in its entirety and replace with the following:

- 15.2.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefore and shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be subject to mediation and other remedies at law or in equity.

Delete subparagraph 15.2.6 and its clauses in their entirety.

15.3 MEDIATION

- 15.3.1 Strike "binding dispute resolution" and insert "any or all remedies at law or in equity".

- 15.3.2 In the first sentence, delete "administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement," Strike "binding dispute resolution" and insert "remedies at law and in equity".

15.4 ARBITRATION

Delete subparagraph 15.4 and its subparagraphs in their entirety.

END OF SECTION 00800 - SUPPLEMENTARY GENERAL CONDITIONS

**SECTION 00850 - DRAWING INDEX**

Sheet No      Title

**APPENDIX A    DRAWING DETAILS**

4                    Gravity Sewer Main and Lateral Trench Detail  
6                    Typical Lateral Cleanout and Lateral Cleanout Replacement

**APPENDIX B    P.C.C. PAVEMENT PATCHING DETAILS**

1 of 5              P.C.C. Pavement Patching  
2 of 5              P.C.C. Pavement Patching  
3 of 5              P.C.C. Pavement Patching  
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**APPENDIX D    DRAWING SHEETS**

1 of 2              Sanitary Sewer Rehabilitation – Sewer Lining  
2 of 2              Sanitary Sewer Rehabilitation – Sewer Lining

END OF SECTION 00850 – DRAWING INDEX

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**SECTION 01005 - ADMINISTRATIVE PROVISIONS****TABLE OF ARTICLES**

1. WORK COVERED BY THE CONTRACT DOCUMENTS
2. CONTRACT METHOD
3. WORK SEQUENCE
4. CONTRACTOR USE OF PREMISES
5. OWNER OCCUPANCY
6. OWNER-FURNISHED PRODUCTS
7. ALLOWANCES
8. ALTERNATES
9. UNIT PRICES
10. APPLICATIONS FOR PAYMENT
11. OWNER SUPPLIED CONSTRUCTION DOCUMENTS
12. COORDINATION
13. FIELD ENGINEERING
14. REFERENCE STANDARDS

**ARTICLE 1: WORK COVERED BY CONTRACT DOCUMENTS**

- 1.1 The work includes, but is not necessarily limited to, the installation of cured-in-place sanitary sewer pipe and lateral liners, installation of lateral cleanouts and all else required to complete the Project in accordance with the Drawings and Specifications.

**ARTICLE 2: CONTRACT METHOD**

- 2.1 Construct the Work under a Unit Price Contract.
- 2.2 Items noted "NIC" (Not in Contract), will be furnished and installed by others.

**ARTICLE 3: WORK SEQUENCE**

- 3.1 Construct Work in stages to accommodate Owner's occupancy requirements during the construction period; coordinate construction schedule and operations.
- 3.2 Begin Work within seven (7) days after issuance of a State purchase order and Notice to Proceed and be Substantially Completed within 90 working days, final completion within 120 working days.

**ARTICLE 4: CONTRACTOR USE OF PREMISES**

- 4.1 Limit use of premises for work and for construction operations to allow for Owner occupancy.
- 4.2 Coordinate use of premises under direction of Owner.

**ARTICLE 5: OWNER OCCUPANCY**

- 5.1 Owner will occupy premises during entire period of construction for the conduct of his normal operations. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

**ARTICLE 6: OWNER-FURNISHED PRODUCTS**

- 6.1 None

**ARTICLE 7: ALLOWANCES**

- 7.1 Schedule of Allowances: (Refer to Bid Form and Section 01020 - Allowances)

**ARTICLE 8: ALTERNATES**

- 8.1 Alternates quoted on Bid Forms will be exercised as Owner option. Accepted Alternates will be listed in Owner-Contractor agreement.
- 8.2 Coordinate related work and modify surrounding work affected by accepted Alternates as required to complete the work.
- 8.3 Schedule of Alternates: (Refer to Bid Form and Section 01030 - Alternates)

**ARTICLE 9: UNIT PRICES**

- 9.1 Unit Prices quoted on Bid Forms will be exercised as Owner option.
- 9.2 Coordinate related work and modify surrounding work affected by accepted Unit Prices as required to complete the Work.
- 9.3 Schedule of Unit Prices: (Refer to Bid Form, Section 01025 – Measurement and Payment, and Section 01026 – Unit Prices)

**ARTICLE 10: APPLICATIONS FOR PAYMENT**

- 10.1 Submit 3 copies of each application under procedures of Sections 00710 and 00800.
- 10.2 Content and Format: Use table of contents of Project Manual.

**ARTICLE 11: OWNER SUPPLIED CONSTRUCTION DOCUMENTS**

- 11.1 The Contractor will be furnished, free of charge, six (6) copies of Drawings and Project Manuals (or less if requested). Additional sets will be furnished at the cost of reproduction, postage and handling.

**ARTICLE 12: COORDINATION**

- 12.1 Coordinate Work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- 12.2 Verify characteristics of elements of interrelated operating equipment are compatible; coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- 12.3 Coordinate space requirements and installation of mechanical, electrical and plumbing work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- 12.4 In finished areas (except as otherwise shown), conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.
- 12.5 Execute cutting and patching to integrate elements of Work, uncover ill-timed defective and non-conforming work, provide openings for penetrations of existing surfaces, and provide samples for testing. Seal penetrations through floors, walls, and ceilings.

**ARTICLE 13: FIELD ENGINEERING**

- 13.1 Provide field engineering services; establish grades, lines, and levels, by use of recognized engineering survey practices.
- 13.2 Control datum for survey is that shown on drawings. Locate and protect control and reference points.

**ARTICLE 14: REFERENCE STANDARDS**

- 14.1 For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- 14.2 The date of the standard is that in effect as of the Bid date, except when a specific date is specified.
- 14.3 Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

END OF SECTION 01005 – ADMINISTRATIVE PROVISIONS

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**SECTION 01010 - SUMMARY OF WORK****TABLE OF ARTICLES**

1. PROJECT DESCRIPTION
2. WORK SEQUENCE
3. CONTRACTOR USE OF PREMISES

**ARTICLE 1: PROJECT DESCRIPTION**

- 1.1 The Contractor for this Project shall furnish all labor, materials, equipment and services necessary for and reasonably incidental to fully perform all the Work indicated as their responsibility and as shown on the Drawings and specified in the Specifications.
- 1.2 The Work shall include the following: Cape Henlopen State Park Sanitary Sewer Rehabilitation – Sewer Lining, as shown on the Drawings and as specified in the Specification Manual in Appendix C and D, including, but not necessarily limited to the following:
  1. Cleaning and televising of main line sewers and cleaning, televising and locating of laterals
  2. Installation of cured-in-place pipe liners for main line sewers and laterals
  3. Installation of lateral clean outs
  4. Inspection Services

**ARTICLE 2: WORK SEQUENCE**

- 2.1 The Work will be conducted in one phase to provide the least possible interference to the activities of the Owner's personnel and to permit an orderly reinstatement of sewer service to the Owner's facilities.

**ARTICLE 3: CONTRACTOR USE OF PREMISES**

- 3.1 General: Limit use of the premises to construction activities in areas indicated.

END OF SECTION 01010 - SUMMARY OF WORK

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## **SECTION 01020 - ALLOWANCES**

### **TABLE OF ARTICLES**

1. RELATED DOCUMENTS
2. SUMMARY
3. EXAMINATION
4. PREPARATION
5. SCHEDULE OF ALLOWANCES

### **ARTICLE 1: RELATED DOCUMENTS**

- 1.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements, and other Division-1 Specification Sections, apply to this Section.

### **ARTICLE 2: SUMMARY**

- 2.1 This Section specifies administrative and procedural requirements for Allowances.
- 2.2 Selected materials and equipment are specified in the Contract Documents by Allowances. In some cases, these Allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- 2.3 Types of Allowances may include the following (Refer to “Schedule of Allowances” included at the end of this Section):
  - .1 Lump-sum Allowances.
  - .2 Unit-cost Allowances.
  - .3 Contingency Allowances.
- 2.4 Selection and Purchase:
  - .1 At the earliest practical date after award of the Contract, advise the Owner of the date when the final selection and purchase of each product or system described by an Allowance must be completed to avoid delaying the Work.
  - .2 At the Owner's request, obtain proposals for each Allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
  - .3 Purchase products and systems specifically selected (in writing) by the Owner.
- 2.5 Submittals:
  - .1 Submit proposals and recommendations for purchase of products or systems included in Allowances, in form required for Change Order.
  - .2 Submit invoices or delivery slips to show the actual quantities of materials delivered to the site for use in fulfillment of each Allowance.

- 2.6 Coordinate Allowance Work with related work to ensure that each selection is completely integrated and interfaced with related work.
- 2.7 Lump-Sum Allowances and Unit-Cost Allowances:
- .1 These Allowances shall cover the cost to the Contractor, less any applicable trade discount, of the materials and equipment required by the Allowance delivered at the site, and all applicable taxes.
  - .2 The Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original Allowance shall be included separately in the Contract Sum and not in the Allowance.
  - .3 Whenever the cost is more than or less than the Allowance, the Contract Sum shall be adjusted accordingly by Change Order:
    - .1 Change Order Mark-up: The amount of each change order resulting from final selection of products and systems covered by an Allowance shall be the difference between the Contractor's purchase price amount and the Allowance, and shall not include Contractor's mark-up (or subcontractor's mark-up) except to the extent clearly demonstrated (by Contractor) that either scope of installation or nature of work required was changed from that which could have been foreseen from description of Allowance and other information in Contract Documents. No mark-up is permitted for selection of higher or lower priced materials or systems, of same scope and nature as originally indicated.
    - .2 Change Order Data: Where applicable, include in each Change Order proposal both the quantities of products being purchased and unit costs, along with total amount of purchase to be made. Where requested, furnish survey-of-requirements data to substantiate quantities. Indicate applicable taxes, delivery charges, and amounts of applicable trade discounts.
- 2.8 Contingency Allowances:
- .1 Use the Contingency Allowance only as directed for the Owner's purposes and only by Change Orders that indicate amounts to be charged to the Allowance.
  - .2 Change Orders authorizing use of funds from the Contingency Allowance, for purchase of products and equipment, will include Contractor's related costs and reasonable overhead and profit margins. These related costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
  - .3 At Project Closeout, credit unused amounts remaining in the Contingency Allowance to the Owner by Change Order.
- 2.9 Unused Materials:
- .1 Return unused materials to the manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.
  - .2 When requested by the Owner, prepare unused material for storage by Owner where it is not economically practical to return the material for credit. When directed by the Owner, deliver unused material to the Owner's storage space. Otherwise, disposal of unused material is the Contractor's responsibility.

**ARTICLE 3: EXAMINATION**

- 3.1 Examine products covered by an Allowance promptly upon delivery for damage or defects.

**ARTICLE 4: PREPARATION**

- 4.1 Coordinate materials and their installation for each Allowance with related materials and installations to ensure that each Allowance item is completely integrated and interfaced with related work.

**ARTICLE 5: SCHEDULE OF ALLOWANCES**

- 5.1 Allowance No. 1: Include, in the Bid, the Lump Sum of \$50,000 for the purchase of inspection services as indicated on the Bid Form and as specified in Division 1, Section 01025.

END OF SECTION 01020 – ALLOWANCES

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**SECTION 01025 – MEASUREMENT AND PAYMENT****TABLE OF ARTICLES**

1. GENERAL
2. AUTHORITY
3. UNIT QUANTITIES SPECIFIED
4. MEASUREMENT OF QUANTITIES
5. PAYMENT
6. BID ITEMS

**ARTICLE 1: GENERAL**

- A. Payment for the work completed under this Contract will be made at the lump sum and unit prices bid, which shall include the furnishing of all labor, tools, equipment and materials, and performance of all work required to complete the project as indicated and specified in accordance with all requirements of the Contract Documents and to the entire satisfaction of the Owner's Engineer.
- B. All incidental and miscellaneous items, work, and materials for which no specific bid item is shown and which are necessary to complete the project in accordance with the contract documents and to maintain and/or repair the work are incidental to the bid items listed below and shall be done and furnished by the Contractor without extra charge.

**ARTICLE 2: AUTHORITY**

- A. The Contractor shall take measurements and compute quantities for all completed work in place and cooperate with, and provide information to, the Engineer as required for the Engineer's verification of measurements and quantities. All measurements and quantities must be verified by the Engineer prior to Owner's approval of payment to the Contractor.

**ARTICLE 3: UNIT QUANTITIES SPECIFIED**

- A. Quantities and measurements indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment. The State of DE is not liable to the Contractor for any additional compensation based on any variance between the estimated quantities and the actual quantities installed during the course of the Project. The Contractor shall be paid solely for the actual quantities of items installed at the bid price.
- B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.
- C. For Bid Items where a Quantity of zero (0) is indicated on the Bid Form, provide a Unit Price on the Bid Form. The extended Total Price for that Bid Item will be zero as indicated on the Bid Form. This Unit Price will be used for contingency purposes to adjust the Contract Amount, should conditions encountered during construction make it applicable.

**ARTICLE 4: MEASUREMENT OF QUANTITIES**

- A. Lineal Foot

1. Measurement of lineal feet to be paid under this section shall be the actual number of lineal feet of material installed in accordance with these specifications, measured as described further in this section, complete, in place and accepted.
  2. The cost of any connections of couplings shall be included in the price bid per linear foot for this item.
- B. Square Yards
1. Measurement of square yards of material to be paid under this section shall be the actual number of square yards of material installed in accordance with these specifications, measured from end to end, complete, in place and accepted.
- C. Cubic Yards
1. Measurement of cubic yards of material to be paid under this section shall be the actual volume of cubic yards of material installed in accordance with these specifications, measured from end to end, complete, in place and accepted.
  2. The maximum payment width for pipe trenches shall be as shown on the drawings.
- D. Each
1. The number of each item installed shall be measured on the actual number of each unit installed in accordance with the plans and specifications, complete, in place and accepted.
  2. The cost of any incidentals shall be included in the price bid for this item.
- E. Lump Sum
1. This item will not be measured.
- F. Tonnage
1. The quantity of tonnage to be measured will be the actual number of tons provided, as documented by certified weight slips, complete, in place and accepted.

#### **ARTICLE 5: PAYMENT**

- A. Payment includes: Full compensation for all required labor, Products, tools, equipment, plant, transportation, services and incidentals, erection, application or installation of an item of the Work; overhead and profit.
- B. Final payment for work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the engineer multiplied by the unit price for work which is incorporated in or made necessary by the work.
- C. Lineal Foot
1. The number of lineal feet as determined above shall be paid for at the contract unit price per lineal foot bid for this item.
- D. Square Yards

1. The square yards of material as measured above shall be paid at the contract unit price bid for the item.
- E. Cubic Yards
1. The cubic yards of material as measured above shall be paid at the contract unit price bid for the item.
- F. Each
1. The number of each item as determined above shall be paid for at the contract unit price bid for the item.
- G. Lump Sum
1. The contract lump sum price will be made under this item in proportion to the amount of work done as determined by the Engineer.
- H. Tonnage
1. Tonnage will be paid at the contract unit bid price for this item upon receipt of certified weight slips.

**ARTICLE 6: BID ITEMS**

- A. Bid Item 1- Mobilization
1. Measurement – This item will not be measured. The Lump Sum payment for this item will be full compensation for providing initial services and facilities required to mobilize for and commence the work of this project as shown, specified and required to provide a complete project.
  2. Payment: The payment for mobilization will be made at 50 % on the first payment requested with the remainder paid in even monthly increments spread out over the Contract Time. Costs to be included under this item shall include such items as bonds, insurance, shop drawings, submittals, temporary facilities and controls, permits, progress schedules, notifications along with other costs and incidentals associated with initiating the work. The maximum amount bid for this item shall not exceed 5% of the total of the Base Bid Item No. 2 to Bid Item No. 20 and shall not exceed 5% of the total of the Alternate Bid No. 1 Bid Item No. 2 to Bid Item No. 18.
- B. Bid Item 2 – NOT USED
- C. Bid Item 3 – Bypass Pumping
1. Measurement – This item will not be measured. The lump sum payment for this item will be full compensation for all work related to the bypass pumping of sewage around the work in accordance with the plans and specifications.
  2. Payment - The contract lump sum price will be paid under this item in proportion to the amount of work done as determined by the Engineer. The price bid shall include, but not be limited to: furnishing and setting up all equipment, labor, and materials necessary to control flow and pump sanitary sewage around the work and segments of pipe being rehabilitated including the bypass pumping of sewage from main line pipe and laterals; energy required for power equipment; temporary installation of bypass pipes under the pavement of cross streets as may be required for traffic; re-

paving of cross streets after removal of temporary by-pass pipes; notifications and coordination with affected property owners, construction facilities and temporary controls; traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and all other necessary equipment, work, and materials required to accomplish sewage by-passing until completion of the rehabilitation process in accordance with the Plans and Specifications. Payment will be based upon completion of the work in accordance with the Plans and Specifications.

D. Bid Item 4 – Restoration

1. Measurement – This item will not be measured. The Lump Sum payment for this item will be full compensation for all work related to the temporary and permanent restoration of the project work area in accordance with the contract documents, complete, in place and accepted.
2. Payment - The contract lump sum price will be paid under this item in proportion to the amount of work done as determined by the Engineer. The price bid shall include, but not be limited to: furnishing and setting up all equipment, labor, and materials necessary to restore the project site in accordance with the requirements of the contract documents including notifications, coordination, environmental protection, the restoration of incidental obstructions to original or better conditions including concrete curb and sidewalk, temporary seeding, permanent seeding, temporary paving, permanent paving, removal of E&S Controls, storage facilities, clean up, restoration of staging areas, removal and proper disposal of surplus materials, restoration, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and all other work necessary to restore areas disturbed by construction.

E. Bid Item 5 – Light Cleaning Sewer Lateral Pipe 4” to 6”

1. Measurement - Measurement of lineal feet to be paid under this section shall be the actual number of lineal feet of lateral pipe cleaned in accordance with these specifications, measured as described further in this section, complete, in place and accepted. Light Cleaning is defined as three or less passes in a lateral pipe segment utilizing High Velocity Jet (Hydrocleaning) Equipment. The light cleaning of sewer laterals will be required to complete the installation of lateral liners. This item will only be paid once per section lateral liner installed and includes all pre and post liner installation cleaning work required. Main line pipe cleaning required to complete the lateral liner installation in pipe will not be measured and paid separately and is considered incidental to the work of this Contract.
2. Payment - The number of lineal feet as determined above shall be paid for at the contract unit price per lineal foot bid for this item measured horizontally from center of main to cleanout or as directed by Engineer for lateral liners. Payment includes full compensation for all required labor, products, tools, equipment, transportation, notifications, services, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and incidentals required to complete the cleaning of sewers in accordance with the specifications including the disposal of material removed from the pipe as a result of cleaning. The Owner will provide a source of water for cleaning, located within the Park. The Contractor is responsible for transportation of water.

- F. Bid Item 6 – Heavy Cleaning of 4” and 6” Sewer Lateral Pipes
1. Measurement –Measurement for this item will be based on the actual number of hours the Contractor is required to work to complete the heavy cleaning of lateral pipes designated in the Contract Documents. The Owner will not be responsible to reimburse the Contractor for time related to equipment failures or inefficiencies and lost time due to poor planning. The Engineer will determine the hours to be paid under this item.
  2. Payment - The hours worked as determined above shall be paid for at the contract unit price bid per hour of cleaning. The unit price bid for this item will be full compensation for providing all labor, Products, material, equipment, tools and incidentals necessary to complete the cleaning of the pipe segments in accordance with the specifications including environmental protection, the preparation of a heavy cleaning plan, notifications, root cutting, easement reels, booster pumps, cleaning hose, material removal, material disposal, construction facilities, traffic control to maintain at least one lane of traffic to vehicular traffic at all times and temporary controls and all other incidental items required to complete the work and allow for television inspection and lining of the sewer lateral pipes. The Owner will provide a source of water for cleaning, located within the Park. The Contractor is responsible for transportation of water.
- G. Bid Item 7 – Light Cleaning Sewer Pipe 6” to 10”
1. Measurement - Measurement of lineal feet to be paid under this section shall be the actual number of lineal feet of pipe cleaned in accordance with these specifications, measured as described further in this section, complete, in place and accepted. Light Cleaning is defined as three or less passes in a main pipe or lateral pipe segment utilizing High Velocity Jet (Hydrocleaning) Equipment. The light cleaning of sewers will be required to complete the installation of CIPP main line liners. This item will only be paid once per section of main line liner installed and includes all pre and post liner installation cleaning work required.
  2. Payment - The number of lineal feet as determined above shall be paid for at the contract unit price per lineal foot bid for this item measured horizontally from center of manhole to center of manhole along the center line of the pipe segment being cleaned for main line liner installation. Payment includes full compensation for all required labor, Products, tools, equipment, transportation, notifications, services, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and incidentals required to complete the cleaning of sewers in accordance with the specifications including the disposal of material removed from the pipe as a result of cleaning. The Owner will provide a source of water for cleaning, located within the Park. The Contractor is responsible for transportation of water.
- H. Bid Item 8 – Heavy Cleaning of 6”, 8” and 10” Sewer Pipes
1. Measurement –Measurement for this item will be based on the actual number of hours the Contractor is required to work to complete the cleaning of main line pipe segments designated for the installation of CIPP main line liners in the Contract Documents. The Owner will not be responsible to reimburse the Contractor for time related to equipment failures or inefficiencies and lost time due to poor planning. The Engineer will determine the hours to be paid under this item.
  2. Payment - The hours worked as determined above shall be paid for at the contract unit price bid per hour of cleaning. The unit price bid for this item will be full

compensation for providing all labor, Products, material, equipment, tools and incidentals necessary to complete the cleaning of the pipe segments in accordance with the specifications including environmental protection, the preparation of a heavy cleaning plan, notifications, root cutting, easement reels, booster pumps, cleaning hose, material removal, material disposal, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and all other incidental items required to complete the work and allow for television inspection and liner installation in the pipe. The Owner will provide a source of water for cleaning, located within the Park. The Contractor is responsible for transportation of water.

Bid Item 8A – Heavy Cleaning Sanitary Sewer Pipe (easement reel not required to complete the work)

Bid Item 8B – Heavy Cleaning Sanitary Sewer Pipe in Difficult Areas (easement reel required to complete the work)

I. Bid Item 9 - Television Inspection of 4” to 6” Sanitary Sewer Lateral Pipes

This bid item includes the television inspection of segments of pipe scheduled for the installation of lateral liners.

1. Measurement - Measurement of lineal feet to be paid under this section shall be the actual number of lineal feet of pipe televised in accordance with these specifications measured from center of main pipe to cleanout or as directed by Engineer for lateral pipes to be lined, complete, in place and accepted.
2. Payment - The number of lineal feet as determined above shall be paid for at the contract unit price per lineal foot bid for this item measured from center of main to cleanout or as directed by the Engineer for lateral pipes being televised. Payment includes full compensation for all required labor, Products, tools, equipment, transportation, notifications, services, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and incidentals required to complete the televising of sewers in accordance with the specifications including the disposal of material removed from the pipe as a result of cleaning.

The lineal feet of CCTV Inspection to be measured and paid on work related to the installation of lateral liners will be paid “One Time” from center of main pipe to cleanout or as directed by the Engineer for lateral liners regardless of the number of times the pipe must be televised to complete the work as required by the Contract Documents.

J. Bid Item 10 - Television Inspection of 6”, 8” and 10” Sanitary Sewer Pipes

This bid item includes the television inspection of segments of pipe scheduled for the installation of CIPP main line liners.

1. Measurement - Measurement of lineal feet to be paid under this section shall be the actual number of lineal feet of pipe televised in accordance with these specifications, measured along the pipe line from center of MH to center of MH complete for main line pipe to be lined.
2. Payment - The number of lineal feet as determined above shall be paid for at the contract unit price per lineal foot bid for this item measured from center of manhole to center of manhole horizontally along the center line of the pipe segment for main line pipe being televised. Payment includes full compensation for all required labor,

Products, tools, equipment, transportation, notifications, services, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and incidentals required to complete the televising of sewers in accordance with the specifications including the disposal of material removed from the pipe as a result of cleaning.

The lineal feet of CCTV Inspection to be measured and paid on work related to the installation of CIPP main line liners will be paid "One Time" from center of MH to center of MH regardless of the number of times the pipe must be televised to complete the work as required by the Contract Documents.

K. Bid Item 11 – Cured in Place Pipe Lateral Lining

1. Measurement – Measurement of the number of each cured in place lateral lining installed shall be based on the actual number of each unit installed in accordance with the plans and specifications in place and accepted. The cost of any incidentals shall be included in the price bid for this item.
2. Payment - The number of each item as determined above shall be paid for at the contract unit price bid for the item. The unit price bid for this item will be full compensation for providing all labor, material, equipment, tools and incidentals for installing the specified CIPP Lateral Liners up to a length of 3'-0" into lateral pipes from the sewer main or a manhole. A separate Bid Item has been included to pay for lateral lining of 4" or 6" lateral pipes beyond the Bid length of 3'-0". The unit prices also includes design of lateral lining system, sonding and locating existing lateral pipes and clean outs, painting the location of the existing lateral pipe on the ground surface, notifications and coordination with property owners, final line cleaning, removal of protruding obstructions, removal and disposal of all excess material, transportation, disposal fees, environmental protection, Quality Control testing, reporting, records, physical condition inspection, post construction inspection, recordings and reproductions, clean up, warranties, warranty inspections and all preparation, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and other items and incidentals required to complete the lining of the lateral sewer pipes in accordance with the contract documents. The Owner will provide a source of water located within the Park. The Contractor is responsible for transportation of water.

Bid Item 11A – Lateral Pipe Liner – 6" Main Interface Seal and 3'-0" of 4" or 6" Lateral Liner

Bid Item 11B – Lateral Pipe Liner – 8" Main Interface Seal and 3'-0" of 4" or 6" Lateral Liner

Bid Item 11C – Lateral Pipe Liner – 10" Main Interface Seal and 3'-0" of 4" or 6" Lateral Liner

Bid Item 11D - Lateral Pipe Liner per LF of Lateral Liner Beyond Bid Length of 3'-0" – 6" Main

Bid Item 11E - Lateral Pipe Liner per LF of Lateral Liner Beyond Bid Length of 3'-0" – 8" Main

Bid Item 11F - Lateral Pipe Liner per LF of Lateral Liner Beyond Bid Length of 3'-0" – 10" Main

L. Bid Item 12 - Cured in Place Pipe Main Line Liner

1. Measurement - Measurement of lineal feet to be paid under this section shall be the actual number of lineal feet of sewer main rehabilitated with a Cured in Place Pipe Liner in accordance with these specifications, measured along the pipe line from center of MH to center of MH complete, in place and accepted.

2. Payment - The lineal feet of CIPP to be paid as determined above shall be paid for at the contract unit price bid for this item. The unit price bid for this item will be full compensation for providing all labor, Products, material equipment, tools and incidentals necessary to install CIPP Liners where directed by the Engineer. The price to install each liner shall be full compensation for all labor, materials, Products and equipment necessary to install the liners in accordance with the requirements of the specifications. The work of this bid item also includes design of the liner system, notifications, reinstatement of active lateral connections, removal of protruding obstructions such as offset joints (a Separate Bid Item has been including for protruding service connections), removal and disposal of all excess material, transportation, disposal fees, environmental protection, Quality Control testing, reporting, records, physical condition inspection, post construction inspection, recordings and reproductions, clean up, warranties, warranty inspections and all preparation, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and other items and incidentals required to complete the lining of the sewer pipes in accordance with the contract documents.

Bid Item 12A – 6” Cured in Place Pipe Main Line Liner

Bid Item 12B – 8” Cured in Place Pipe Main Line Liner

Bid Item 12C – 10” Cured in Place Pipe Main Line Liner

Bid Item 12D – Reinstatement Active Lateral Connections to Lined Pipe

M. Bid Item 13 – Removal of Protruding Service Connections

1. Measurement - Measurement will be based on the actual number of protruding service connections removed per the requirements of the contract documents and accepted.
2. Payment - The number of each item as determined above shall be paid for at the contract unit price bid for this item. The unit price bid for this item will be full compensation for providing all labor, Products, material equipment, tools and incidentals necessary to remove or grind back protruding laterals. The work of this bid item also includes notifications, traffic control to maintain one lane of the roadway to vehicular traffic at all times, bypass pumping, televising, pipe cleaning, testing, warranty inspections, construction facilities and temporary controls and all other incidental work necessary to comply with the Contract Documents.

N. Bid Item 14 – Sanitary Sewer Lateral Spot Repairs

The television inspection of lateral pipes to be lined under the work of this Contract may reveal spot repairs in lateral pipes required to facilitate the lining of laterals. The Contractor shall assume that the spot repairs will involve removal of deficient pipe, wye connections, cleanouts and replacement with new PVC pipe and fittings coupled to the existing pipe that remains with rigid couplings. The Contractor shall assume that a maximum of 10'-0" of pipe will be replaced with new SDR 35 PVC pipe. The Contractor shall protect the existing pipe during the excavation and backfill process to assure that otherwise sound piping is not damaged resulting in the replacement of pipe beyond the limits described above.

This bid item includes repair of deficiencies in the existing lateral pipe that are required to facilitate the installation of the CIPP Lateral Liners.

1. Measurement - Measurement will be based on the actual number of spot repairs completed, in place and accepted.

2. Payment – The number of each item as determined above shall be paid for at the contract unit price bid for this item. The unit price bid for these items will be full compensation for providing all labor, material, equipment, tools and incidentals necessary to complete the spot repairs including notifications, test pits to locate utilities, E&S controls, excavation, shoring, removal and disposal of existing pipe, dewatering, new pipe & rigid couplings to existing pipe, bedding, furnishing and placing Type C Borrow backfill full depth of pipe and compaction of backfill, testing of backfill, temporary paving, permanent paving, restoration to the existing surface, CCTV inspection of pipe after placement, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and all other items of work necessary to complete the spot repairs in accordance with the requirements of the Contract Documents.

O. Bid Item 15 – Clean Out Installation in Existing Lateral Pipes

1. Measurement – Measurement will be based on the number of clean outs actually installed per the requirements of the contract document.
2. Payment – Payment will be based on the contract unit price bid for each clean out. The price bid to install clean outs on 4” and 6” sanitary sewer lateral pipes includes all work necessary to locate the existing lateral pipe at proposed clean out locations by sonding the lateral pipes from the main using a main line lateral launch camera, survey and layout, notifications, site clearing, excavation, excavation support in accordance with OSHA requirements, dewatering excavations, clean out installation with new wye fittings, protective frame and cover, rigid couplings to existing pipe, AASHTO #7 backfill, Type C Borrow backfill, all restoration including but not limited to paving restoration, concrete restoration, brick restoration, grass restoration, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and all other items incidental and necessary to complete the work as specified and shown in the contract documents.

P. Bid Item 16 – Dye Testing Service Connections

It may be necessary for the Contractor to dye test service connections prior to lining the pipe to determine if an existing service connection is live or abandoned.

1. Measurement - Measurement will be based on the actual number of existing service connections dye tested complete, in place and accepted.
2. Payment – The number of each item as determined above shall be paid for at the contract unit price bid for this item. The unit price bid for these items will be full compensation for providing all labor, material, equipment, tools and incidentals necessary to complete the dye testing including dye, **mainline sewer inspection camera**, notifications, coordination with property owners, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and all other items of work necessary to complete the dye testing in accordance with the requirements of the Contract Documents.

Q. Bid Item 17 – 3'-0” Sectional Cured in Place Pipe (CIPP) Liner Repair of 6” Pipe

1. Measurement - Measurement will be based on the actual number of CIPP sectional liners completed per the requirements of the contract documents and accepted.
2. Payment - The number of each item as determined above shall be paid for at the contract unit price bid for this item. The unit price bid for this item will be full compensation for providing all labor, Products, material equipment, tools and incidentals necessary to install

a 3'-0" long sectional CIPP sectional liner where directed by the Engineer. The price to install each liner shall be full compensation for all labor, materials, Products and equipment necessary to install the sectional liners in accordance with the requirements of the specifications. The work of this bid item also includes notifications, warranty inspections, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and all other incidental work necessary to comply with the Contract Documents.

R. Bid Item 18 – Grout

1. Measurement – The quantity of grout will be measured by the actual number of gallons of grout used to stop active infiltration into the existing pipe to be lined under this project.
2. Payment – The unit price for this item has been fixed by the Engineer at \$9.00 per gallon of grout which will be full compensation for providing all labor, material, equipment, tools, construction facilities and temporary controls, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and incidentals necessary to furnish the grout to seal points of suspected or active infiltration into pipe and structures.

S. Bid Item 19 – Pre-liner

1. Measurement - Measurement of lineal feet of pre-liner to be paid for under this section shall be the actual number of lineal feet of pre-liner installed in accordance with these specifications, measured along the pipe line from center of MH to center of MH complete, in place and accepted.
2. Payment - The lineal feet of pre-liner to be paid for as determined above shall be paid for at the contract unit price bid for this item. The unit price bid for this item will be full compensation for providing all labor, products, material, equipment, tools, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and incidentals necessary to install the pre-liner in accordance with the requirements of the specifications.

Bid Item 19A – 6" Pre-Liner  
Bid Item 19B – 8" Pre-Liner  
Bid Item 19C – 10" Pre-Liner

T. Bid Item 20 – Packer Injection Chemical Grouting

1. Measurement - Measurement will be based on the actual number of pipe joints and laterals pressure grouted per the requirements of the contract documents and accepted.
2. Payment - The number of each item as determined above shall be paid for at the contract unit price bid for this item. The unit price bid for this item will be full compensation for providing all labor, products, material (except grout), equipment, tools and incidentals necessary to pressure grout and chemically seal pipe joints and lateral connections to the main. The bid item also includes clean up, removal of excess grout from the mainline sewer, disposal of debris, traffic control to maintain at least one lane of the roadway to vehicular traffic at all times and record keeping. The gallons of grout used will be paid separately under another bid item.

Bid Item 20A – Sewer Pipe Joint Packer Injection Chemical Grouting 8" to 10" pipe  
Bid Item 20B – Lateral Connection Packer Injection Grouting 8" to 10" pipe

- T. Bid Item 21 – Allowance No. 1 – Inspection Services
1. Measurement – This item will not be measured. The lump sum payment for this item is for the inspection services used throughout the course of the project in accordance with the inspection services contract, as directed by the Owner.
  2. Payment – Payment will be based upon completion of the work in accordance with the inspection services contract, as directed by the Owner.
  3. A Lump-Sum Allowance of \$50,000 has been established for this item. Refer to Bid Form and Section 01020 – Allowances.

END OF SECTION 01025 – MEASUREMENT AND PAYMENT

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**SECTION 01026 - UNIT PRICES****TABLE OF ARTICLES**

1. RELATED DOCUMENTS
2. SUMMARY
3. UNIT PRICE SCHEDULE

**ARTICLE 1: RELATED DOCUMENTS**

- 1.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements, and other Division-1 Specification Sections, apply to this Section. Refer to Section 01025 - Measurement and Payment.

**ARTICLE 2: SUMMARY**

- 2.1 This Section specifies administrative and procedural requirements for Unit Prices.
  - .1 A Unit Price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for payment for Work completed. A Unit Price may be used for payment for Work that will be added to, or deducted from, the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.
  - .2 Unit Prices include all necessary material, labor, tools, equipment, overhead, profit and applicable taxes.
  - .3 Refer to individual Specification Sections for construction activities requiring the establishment of Unit Prices. Methods of measurement and payment for Unit Prices are specified in Section 01025 - Measurement and Payment.
- 2.2 Schedule: A "Unit Price Schedule" is included at the end of this Section. Specification Sections in the Project Manual contain requirements for materials and methods necessary to achieve the Work described under each Unit Price.
  - .1 The Contractor shall provide the services of a Delaware licensed Professional Land Surveyor to take all measurements and compute quantities. The Engineer will verify measurements and quantities.
  - .2 The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established Unit Prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

**ARTICLE 3: UNIT PRICE SCHEDULE**

Refer to Section 00300 – Bid Form and Section 01025 - Measurement and Payment.

END OF SECTION 01026 - UNIT PRICES

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## SECTION 01030 - ALTERNATES

### TABLE OF ARTICLES

1. RELATED DOCUMENTS
2. SUMMARY
3. SCHEDULE OF ALTERNATES

### ARTICLE 1: RELATED DOCUMENTS

- 1.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements, and other Division-1 Specification Sections, apply to this Section.

### ARTICLE 2: SUMMARY

- 2.1 This Section specifies administrative and procedural requirements for Alternates.
- 2.2 Definition: An Alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the bidding requirements that may be added to or deducted from Base Bid amount if the Owner decides to accept the corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.
- 2.3 Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the Project.
- 2.4 Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.
- 2.5 Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections in the Project Manual contain requirements for materials and methods necessary to achieve the Work described under each Alternate.
  - .1 Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

### ARTICLE 3: SCHEDULE OF ALTERNATES:

#### Alternate No. 1: Lateral Pipes

This Alternate includes cleaning and televising of lateral sewer pipes and the installation of cured-in-place lateral pipe liners and all associated work, as described on the Bid Form, in Section 01025, and elsewhere in this project Manual.

END OF SECTION 01030 – ALTERNATES

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**SECTION 01040 - PROJECT COORDINATION****TABLE OF ARTICLES**

1. RELATED DOCUMENTS
2. SUMMARY
3. COORDINATION
- 3.1 NOTIFICATIONS
4. SUBMITTALS
5. GENERAL INSTALLATION PROVISIONS
6. CLEANING AND PROTECTION

**ARTICLE 1: RELATED DOCUMENTS**

- 1.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements, and other Division-1 Specification Sections, apply to this Section

**ARTICLE 2: SUMMARY**

- 2.1 This Section specifies administrative and supervisory requirements necessary for Project Coordination including, but not necessarily limited to:
  - .1 Coordination.
  - .2 Notification.
  - .3 Administrative and Supervisory Personnel.
  - .4 General Installation Provisions.
  - .5 Cleaning and Protection.
- 2.2 Field engineering is included in Section "Field Engineering".
- 2.3. Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings".
- 2.4. Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

**ARTICLE 3: COORDINATION**

- 3.1 Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
  - .1 Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
  - .2 Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
  - .3 Make adequate provisions to accommodate items scheduled for later installation.
- 3.2 Where necessary, prepare memoranda for distribution to each party involved outlining special

procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

- .1 Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- 3.3 Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
- .1 Preparation of schedules.
  - .2 Installation and removal of temporary facilities.
  - .3 Delivery and processing of submittals.
  - .4 Progress meetings.
  - .5 Project Close-out activities.
- 3.4 Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
- .1 Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

#### **ARTICLE 3.1: NOTIFICATIONS**

- 4.1 Notices to Owner/Engineer:
- .1 Notify the State of Delaware (Owner) and the Engineer in writing at least 7 days in advance of beginning any Work on Site. Upon receipt of Notice to Proceed, contact the Owner to schedule a pre-construction meeting.
- 4.2 Notices to other utilities/agencies:
- .1 Make the appropriate utility "one call" and notify owners of adjacent utilities when prosecution of the Work may affect them.
  - .2 Contact responsible agencies 48 hours in advance of cutting paving or excavating in streets.
  - .3 Notify utilities and other concerned agencies at least 48 hours prior to excavating near pole lines.
- 4.3 Notices to Owner' representative:
- .1 Coordinate with Owner and identify areas that contain the Work, are adjacent to the Work or will be affected by the Work at least one week prior to beginning the work. Notifications shall be verbal but also shall include a schedule and a letter providing a description of the work, anticipated schedule, and completion dates along with the Contractors name, phone number and name of the responsible party designated to answer questions for the Contractor. If the phasing of the work dictates a lull in the work greater than a week, an additional notice will be required prior to returning to work in that area. The initial notice should discuss the anticipated lull due to phasing.
  - .2 Notify Owner at least 48 hours prior to the disruption of any services including sewer, water, electric, gas, access to property, etc.

- .3 Notify Owner immediately after a return to normal service.

#### **ARTICLE 4: SUBMITTALS**

- 5.1 Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

#### **ARTICLE 5: GENERAL INSTALLATION PROVISIONS**

- 6.1 Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- 6.2 Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- 6.3 Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- 6.4 Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- 6.5 Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- 6.6 Recheck measurements and dimensions, before starting each installation.
- 6.7 Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- 6.8 Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- 6.9 Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

#### **ARTICLE 6: CLEANING AND PROTECTION**

- 7.1 During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- 7.2 Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- 7.3 Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
  - .1 Excessive static or dynamic loading.

- .2 Excessive internal or external pressures.
- .3 Excessively high or low temperatures.
- .4 Thermal shock.
- .5 Excessively high or low humidity.
- .6 Air contamination or pollution.
- .7 Water or ice.
- .8 Solvents.
- .9 Chemicals.
- .10 Light.
- .11 Radiation.
- .12 Puncture.
- .13 Abrasion.
- .14 Heavy traffic.
- .15 Soiling, staining and corrosion.
- .16 Bacteria.
- .17 Rodent and insect infestation.
- .18 Combustion.
- .19 Electrical current.
- .20 High speed operation.
- .21 Improper lubrication.
- .22 Unusual wear or other misuse.
- .23 Contact between incompatible materials.
- .24 Destructive testing.
- .25 Misalignment.
- .26 Excessive weathering.
- .27 Unprotected storage.
- .28 Improper shipping or handling.
- .29 Theft.
- .30 Vandalism.
- .31 Wind damage.

END OF SECTION 01040 - PROJECT COORDINATION

**SECTION 01050 - FIELD ENGINEERING****TABLE OF ARTICLES**

1. RELATED DOCUMENTS
2. SUMMARY
3. SUBMITTALS
4. QUALITY ASSURANCE
5. EXAMINATION
6. PERFORMANCE

**ARTICLE 1: RELATED DOCUMENTS**

- 1.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements, and other Division-1 Specification Sections, apply to this Section

**ARTICLE 2: SUMMARY**

- 2.1 General: This Section specifies administrative and procedural requirements for Field Engineering services, including, but not necessarily limited to, the following:
  - .1 Land Survey Work
  - .2 Engineering Services

**ARTICLE 3: SUBMITTALS**

- 3.1 Certificates: Submit a certificate signed by the Land Surveyor certifying that the location and elevation of improvements comply with the Contract Documents.
- 3.2 Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Sections "Submittals" and "Project Closeout".

**ARTICLE 4: QUALITY ASSURANCE**

- 4.1 Surveyor: Engage a Professional Land Surveyor, licensed in the State of Delaware, to perform required surveying services to ensure that grades, lines, levels, and locations of the Work are in compliance with the Contract Documents.
- 4.2 Engineer: Engage a Professional Engineer of the discipline required, registered in the State of Delaware, to perform required engineering services.

**ARTICLE 5: EXAMINATION**

- 5.1 The Owner will identify existing control points and property line corner stakes.
- 5.2 Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
  - .1 Do not change or relocate benchmarks or control points without prior written approval.

Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.

- .2 Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.
- 5.3 Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.
  - .1 Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- 5.4 Existing utilities and equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction.

#### **ARTICLE 6: PERFORMANCE**

- 6.1 Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
  - .1 Advise entities engaged in construction activities, of marked lines and levels provided for their use.
  - .2 As construction proceeds, check every major element for line, level and plumb.
- 6.2 Surveyor's Log: Maintain a surveyor's log of control and other survey Work. Make this log available for reference.
  - .1 Record deviations from required lines and levels, and advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
  - .2 On completion of foundation walls, major site improvements, and other Work requiring field engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and sitework.
- 6.3 Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.
- 6.4 Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical work.

END OF SECTION 01050 - FIELD ENGINEERING

## SECTION 01090 - DEFINITIONS AND STANDARDS

### TABLE OF ARTICLES

1. DEFINITIONS
2. SPECIFICATION FORMAT AND CONTENT EXPLANATION
3. DRAWING OF SYMBOLS
4. INDUSTRY STANDARDS

### ARTICLE 1: DEFINITIONS:

- 1.1 Basic Contract definitions are included in the General Conditions, Supplementary General Conditions, General Requirements, and Instructions to Bidders.
- 1.2 INDICATED refers to graphic representations, notes or schedules on Drawings, or Paragraphs or Schedules in Specifications, and similar requirements in Contract Documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used, it is to help locate the reference.
- 1.3 DIRECTED: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. No implied meaning shall be interpreted to extend the Owner's Representative's responsibility into the Contractor's supervision of construction.
- 1.4 APPROVE, used in conjunction with action on submittals, applications, and requests, is limited to the Owner's Representative's duties and responsibilities stated in General Conditions and Supplementary General Conditions. Approval shall not release the Contractor from responsibility to fulfill Contract requirements.
- 1.5 REGULATION includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, and rules, conventions and agreements within the construction industry that control performance of the Work, whether lawfully imposed by authorities having jurisdiction or not.
- 1.6 FURNISH means "supply and deliver, ready for unloading, unpacking, assembly, installation, and similar operations."
- 1.7 INSTALL describes operations at the site including "unloading, unpacking, assembly, erection, anchoring, applying, working to dimension, protecting, cleaning and similar operations."
- 1.8 PROVIDE means "furnish and install, complete and ready for use."
- 1.9 INSTALLER: "Installer" is the Contractor or an entity engaged by the Contractor, as an employee, subcontractor or sub-subcontractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
  - .1 The term "experienced", when used with "Installer" means having a minimum of 5 previous projects similar in size to this Project, and familiar with the precautions required, and with requirements of the authority having jurisdiction.
- 1.10 PROJECT SITE is the space available for construction activities, either exclusively or with others performing other construction on the Project. The extent of the Project Site shall be as directed by the Owner's Representative, and may or may not be identical with the description of the land upon

which the Project is to be built.

- 1.11 TESTING LABORATORIES: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, at the Project Site or elsewhere, and to report on, and, if required, to interpret results of those inspections or tests.
- 1.12 WORKING DAY: Any calendar day, except: 1) Saturdays, Sundays, and holidays; 2) days where conditions identified in the Contract require the Contractor to suspend construction operations; 3) days with inclement weather that prevents prosecution of the scheduled work. On inclement weather days that result in partial prosecution of the work, partial working days will be charged as determined by the Engineer. Partial working days will be charged in one-quarter day increments. If the Contractor receives permission from the Engineer to work on a Sunday or holiday, full working days will be charged, weather permitting. No time charge will be assessed if the Contractor elects to work on Saturdays. Should the Contractor prepare to begin work on any day on which inclement weather prevents the work from beginning at the usual starting time and the crew is dismissed as a result, the Contractor will not be charged for a working day whether or not conditions change during the day and the rest of the day becomes suitable for construction operations.

## **ARTICLE 2: SPECIFICATION FORMAT AND CONTENT EXPLANATION**

- 2.1 SPECIFICATION FORMAT: These specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTER FORMAT numbering system.
- 2.2 Language used in the Specifications is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the context so indicates.
  - .1 IMPERATIVE LANGUAGE is used generally. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text subjective language is used to describe responsibilities which must be fulfilled indirectly by the Contractor, or by others when so noted.
  - .2 The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.
- 2.3 ASSIGNMENT OF SPECIALISTS: Certain construction activities shall be performed by specialists, recognized experts in the operations to be performed. Specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

## **ARTICLE 3: DRAWING OF SYMBOLS**

- 3.1 GENERAL: Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., ninth edition.
- 3.2 MECHANICAL/ELECTRICAL DRAWINGS: Graphic symbols on mechanical and electrical Drawings are aligned with symbols recommended by ASHRAE. Where appropriate, they are supplemented by symbols recommended by technical associations. Refer instances of uncertainty to the Engineer for clarification before proceeding.

## **ARTICLE 4: INDUSTRY STANDARDS**

- 4.1 APPLICABILITY OF STANDARDS: Except where the Contract Documents include more stringent

requirements, applicable industry standards have the same force and effect as if bound or copied into Contract Documents. Such standards are part of the Contract Documents by reference. Individual Sections indicate standards the Contractor must keep available at the Project Site.

- 4.2 PUBLICATION DATES: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of Contract Documents.
- .1 UPDATED STANDARDS: Submit a Change Order proposal where an applicable standard has been revised and reissued after the date of the Contract Documents and before performance of Work. The Engineer will decide whether to issue a Change Order to proceed with the updated standard.
- 4.3 CONFLICTING REQUIREMENTS: Where compliance with two or more standards that establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced. Refer uncertainties as to which quality level is more stringent to the Engineer for a decision before proceeding.
- .1 MINIMUM QUANTITIES OR QUALITY LEVELS: The quantity or quality shown or specified is the minimum to be provided or performed. Indicated values are minimum or maximum values, as appropriate for the requirements. Refer instances of uncertainty to the Engineer for decision before proceeding.
- 4.4 COPIES OF STANDARDS: Each entity engaged on the Project shall be familiar with standards applicable to that activity. Copies of applicable standards are not bound with the Contract Documents.
- .1 Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.
- .2 Although copies of standards needed for enforcement of requirements may be part of submittals, the Owner's Representative reserves the right to require submittal of additional copies for enforcement of requirements.
- 4.5 ABBREVIATIONS AND NAMES: Where acronyms or abbreviations are used in the Specifications or other Contract Documents they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction or other entity applicable. Refer to the "Encyclopedia of Associations", published by Gale, available in most libraries.
- 4.6 PERMITS, LICENSES, AND CERTIFICATES: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

END OF SECTION 01090 - DEFINITIONS AND STANDARDS

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## 2014 HOLIDAYS

STATE OF DELAWARE 2014 Holidays		
In accordance with Title 1, Chapter 5, §501, Delaware Code, as amended, the following are legal holidays in the State of Delaware for Calendar Year <b>2014</b> :		
<b>New Years Day</b>	January 1	Wednesday
<b>Martin Luther King Jr. Day</b>	January 20	Monday
<b>Good Friday</b>	April 18	Friday
<b>Memorial Day</b>	May 26	Monday
<b>Independence Day</b>	July 4	Friday
<b>Labor Day</b>	September 1	Monday
Election Day	November 4	Tuesday
Return Day (after 12:00 noon Sussex County)	November 6	Thursday
<b>Veterans Day</b>	November 11	Tuesday
<b>Thanksgiving Day</b>	November 27	Thursday
<b>Day After Thanksgiving</b>	November 28	Friday
<b>Christmas Day</b>	December 25	Thursday

Revised: 07/2013

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## SECTION 01200 - PROJECT MEETINGS

### TABLE OF ARTICLES

1. RELATED DOCUMENTS
2. SUMMARY
3. PRE-CONSTRUCTION CONFERENCE
4. PRE-INSTALLATION CONFERENCES
5. COORDINATION MEETINGS
6. PROGRESS MEETINGS

#### ARTICLE 1: RELATED DOCUMENTS

- 1.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements, and other Division-1 Specification Sections, apply to this Section.

#### ARTICLE 2: SUMMARY

- 2.1 This Section specifies administrative and procedural requirements for Project Meetings including but not limited to:
  - .1 Pre-Construction Conference.
  - .2 Pre-Installation Conferences.
  - .3 Coordination Meetings.
  - .4 Progress Meetings.
- 2.2 Construction schedules are specified in another Division-1 Section.

#### ARTICLE 3: PRE-CONSTRUCTION CONFERENCE

- 3.1 Schedule a pre-construction conference and organizational meeting at the Project Site or other convenient location no later than 15 days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- 3.2 Attendees: The Owner, Engineer and their consultants, the Contractor and their superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.
- 3.3 Agenda: Discuss items of significance that could affect progress including such topics as:
  - .1 Tentative construction schedule.
  - .2 Critical work sequencing.
  - .3 Designation of responsible personnel.
  - .4 Procedures for processing field decisions and Change Orders.
  - .5 Procedures for processing Applications for Payment.
  - .6 Distribution of Contract Documents.
  - .7 Submittal of Shop Drawings, Product Data and Samples.
  - .8 Preparation of record documents.
  - .9 Use of the premises.
  - .10 Parking availability
  - .11 Office, work and storage areas.

- .12 Equipment deliveries and priorities.
- .13 Safety procedures.
- .14 First aid.
- .15 Security.
- .16 Housekeeping.
- .17 Working hours.

#### **ARTICLE 4: PRE-INSTALLATION CONFERENCES**

- 4.1 Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Engineer of scheduled meeting dates.
- .1 Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
- .1 Contract Documents.
  - .2 Options.
  - .3 Related Change Orders.
  - .4 Purchases
  - .5 Deliveries.
  - .6 Shop Drawings, Product Data and quality control Samples.
  - .7 Review of mockups
  - .8 Possible conflicts.
  - .9 Compatibility problems.
  - .10 Time schedules.
  - .11 Weather limitations.
  - .12 Manufacturer's recommendations.
  - .13 Warranty requirements.
  - .14 Compatibility of materials.
  - .15 Acceptability of substrates.
  - .16 Temporary facilities.
  - .17 Space and access limitations.
  - .18 Governing regulations.
  - .19 Safety.
  - .20 Inspection and testing requirements.
  - .21 Required performance results.
  - .22 Recording requirements.
  - .23 Protection.
- 4.2 Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Engineer.
- 4.3 Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

#### **ARTICLE 5: COORDINATION MEETINGS**

- 5.1 Conduct Project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.

- 5.2 Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.
- 5.3 Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

#### **ARTICLE 6: PROGRESS MEETINGS**

- 6.1 Conduct progress meetings at the Project Site at regularly scheduled intervals. Notify the Owner and Engineer of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- 6.2 Attendees: In addition to representatives of the Owner and Engineer, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.
- 6.3 Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.
  - .1 Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - .2 Review the present and future needs of each entity present, including such items as:
    - .1 Interface requirements.
    - .2 Time.
    - .3 Sequences.
    - .4 Deliveries.
    - .5 Off-site fabrication problems.
    - .6 Access.
    - .7 Site utilization.
    - .8 Temporary facilities and services.
    - .9 Hours of work.
    - .10 Hazards and risks.
    - .11 Housekeeping.
    - .12 Quality and work standards.
    - .13 Change Orders.
    - .14 Documentation of information for payment requests.
    - .15 Submittals and other items affecting progress of work.
- 6.4 Reporting: No later than 5 days after each progress meeting date, the Owner will distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
  - .1 Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

END OF SECTION 01200 - PROJECT MEETINGS

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## **SECTION 01300 - SUBMITTALS**

### **TABLE OF ARTICLES**

1. REQUIREMENTS INCLUDED
2. PROCEDURES
3. CONSTRUCTION PROGRESS SCHEDULES
4. SCHEDULE OF VALUES
5. SHOP DRAWINGS
6. PRODUCT DATA
7. MANUFACTURERS' INSTRUCTIONS
8. SAMPLES
9. FIELD SAMPLES
10. ITEMS TO BE SUBMITTED AT CONTRACT SIGNING
11. COLOR SELECTION
12. SUBMITTAL SCHEDULE

### **ARTICLE 1: REQUIREMENTS INCLUDED**

- 1.1 Procedures.
- 1.2 Construction Progress Schedules.
- 1.3 Schedule of Values.
- 1.4 Shop Drawings.
- 1.5 Product Data.
- 1.6 Samples.
- 1.7 Manufacturers' Instructions.
- 1.8 Manufacturers' Certificates.
- 1.9 Submittal Schedule.

### **ARTICLE 2: PROCEDURES**

- 2.1 Deliver submittals to Owner at 89 Kings Highway, Dover, Delaware.
- 2.2 Transmit each item under a transmittal. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix. Identify Project, Contractor, subcontractor, major supplier; identify pertinent Drawing sheet and detail number, and Specification section number, as appropriate. Identify deviations from Contract Documents. Provide space for Contractor and Engineer review stamps. Allow 2 weeks for Engineer's initial processing of submittals requiring review and return. Submittals will be returned without action when received indirectly (not through the Contractor).
- 2.3 Submit initial progress schedules and schedule of values in duplicate within fourteen (14) days after award of Contract. After review by Engineer, revise and resubmit as required. Submit revised schedules reflecting changes since previous submittal.
- 2.4 Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.
- 2.5 After Engineer's review of submittal, revise and resubmit as required, identifying changes made since previous submittal.
- 2.6 Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

- 2.7 Submit a complete schedule of submittals in duplicate within (20) days after award of Contract. After review by Engineer, revise and resubmit as required. Submit revised schedules reflecting changes since previous submittal.

### **ARTICLE 3: CONSTRUCTION PROGRESS SCHEDULES**

- 3.1 Submit horizontal bar chart with separate bar for each major trade or operation identifying first work day of each week.

### **ARTICLE 4: SCHEDULE OF VALUES**

- 4.1 Submit typed schedule on AIA Form G703. Contractor's standard form or media-driven printout will be considered on request.
- 4.2 Format: Table of Contents of this Project Manual. Identify each line item with number and title of the major Specification sections.
- 4.3 Include in each line item amount of Allowances specified in Section 01020. For Unit Cost Allowances, give quantities measured from Contract Documents multiplied by the unit cost equal to the total for the item.
- 4.4 Include in each line item a directly proportional amount of Contractor's overhead and profit.
- 4.5 Revise schedule to list Change Orders, for each application for payment.

### **ARTICLE 5: SHOP DRAWINGS**

- 5.1 Submit the number of opaque reproducibles which Contractor requires, plus four (4) copies which will be retained by Engineer.
- 5.2 Submit for approval completely dimensioned shop, layout or setting drawings and catalog cuts or other data as required to provide a complete description of system equipment.
- 5.3 Submit completely dimensioned shop drawings certified for construction by the manufacturer and approved by the Contractor which includes in plan and cross section, location of electrical connections and characteristics; wiring diagrams; utility requirements as to types, sizes and locations; anchor bolt layout; details indicating construction and materials of construction; diameter of shafting; dimensions and rated horsepower of all motors; gear and bearing ratings; service factors and weights of principal parts and completely assembled equipment.

### **ARTICLE 6: PRODUCT DATA**

- 6.1 Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to the Work. Include manufacturers' installation instructions when required by the Specification Section.
- 6.2 Submit the number of copies which Contractor requires, plus four (4) copies which will be retained by Engineer.

### **ARTICLE 7: MANUFACTURERS' INSTRUCTIONS**

- 7.1 When required in individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for product data.

**ARTICLE 8: SAMPLES**

- 8.1 Submit full range of manufacturers' standard colors, textures, and patterns for Architect's selection. Submit samples for selection of finishes within thirty (30) days after date of Contract.
- 8.2 Submit Samples to illustrate functional characteristics of the Product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.
- 8.3 Include identification of each Sample, giving full information.
- 8.4 Submit the number specified in respective Specification Section; one will be retained by Engineer. Reviewed Samples which may be used in the Work are indicated in the Specification Section.

**ARTICLE 9: FIELD SAMPLES**

- 9.1 Provide field samples of finishes at Project as required by individual Specifications Section. Install sample complete and finished. Acceptable samples in place may be retained in completed Work.

**ARTICLE 10: ITEMS TO BE SUBMITTED AT CONTRACT SIGNING**

- 10.1 Performance and Labor and Material Payment Bonds: One (1) copy of each bond for each copy of the Agreement, submit simultaneously with the signed Agreement.
- 10.2 Policies or Certificates of Insurance: One (1) copy of each policy or certificate for each copy of the Agreement, submit simultaneously with the signed Agreement.

**ARTICLE 11: COLOR SELECTION**

- 11.1 Submit all items requiring color selection together (at one time) to facilitate color coordination by Architect.

**ARTICLE 12: SUBMITTAL SCHEDULE** *(If Submittal Schedule is not required, Delete Article 12 in entirety)*

- 12.1 Provide the following information:
  - .1 Scheduled date for the first submittal.
  - .2 Related Section number.
  - .3 Submittal category (Shop Drawings, Product Data, or Samples).
  - .4 Name of Subcontractor.
  - .5 Description of the part of the Work covered.

END OF SECTION 01300 - SUBMITTALS

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**SECTION 01400 - QUALITY CONTROL****TABLE OF ARTICLES**

1. REQUIREMENTS INCLUDED
2. RELATED REQUIREMENTS
3. QUALITY CONTROL, GENERAL
4. WORKMANSHIP
5. MANUFACTURER'S INSTRUCTIONS
6. MANUFACTURER'S CERTIFICATES
7. MOCK-UPS
8. MANUFACTURER'S FIELD SERVICES
9. TESTING LABORATORY SERVICES

**ARTICLE 1: REQUIREMENTS INCLUDED**

- 1.1 General Quality Control.
- 1.2 Workmanship.
- 1.3 Manufacturer's Instructions.
- 1.4 Manufacturer's Certificates.
- 1.5 Mock-ups.
- 1.6 Manufacturer's Field Services.
- 1.7 Testing Laboratory Services.

**ARTICLE 2: RELATED REQUIREMENTS**

- 2.1 Section 00700 - General Conditions and Section 00710 - General Requirements: Inspection and testing required by governing authorities.

**ARTICLE 3: QUALITY CONTROL, GENERAL**

- 3.1 Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

**ARTICLE 4: WORKMANSHIP**

- 4.1 Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- 4.2 Perform Work by persons qualified to produce workmanship of specified quality.
- 4.3 Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

**ARTICLE 5: MANUFACTURER'S INSTRUCTIONS**

- 5.1 Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Architect before proceeding.

**ARTICLE 6: MANUFACTURER'S CERTIFICATES**

- 6.1 When required by individual Specifications Section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

**ARTICLE 7: MOCK-UPS**

- 7.1 When required by individual Specifications Section, erect complete, full-scale mockup of assembly at Project Site.

**ARTICLE 8: MANUFACTURER'S FIELD SERVICES**

- 8.1 When specified in respective Specification Sections, require manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations.
- 8.2 Representative shall submit written report to Owner listing observations and recommendations.

**ARTICLE 9: TESTING LABORATORY SERVICES**

- 9.1 Contractor shall employ and pay for services of an Independent Testing Laboratory to perform inspections, tests, and other services required by various Specification Sections.
- 9.2 Services will be performed in accordance with requirements of governing authorities and with specified standards.
- 9.3 Reports will be submitted to Owner in triplicate giving observations and results of tests, indicating compliance or noncompliance with specified standards and with Contract Documents.
- 9.4 Contractor shall cooperate with Testing Laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.
- .1 Notify Owner and Testing Laboratory 24 hours prior to expected time for operations requiring testing services.
- .2 Make arrangements with Testing Laboratory and pay for additional samples and tests for Contractor's convenience.
- 9.5 Any item found unsatisfactory by the testing agency shall be removed, replaced and retested at no additional cost to the Owner.

END OF SECTION 01400 - QUALITY CONTROL

**SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS****TABLE OF ARTICLES**

1. GENERAL PROVISIONS
2. REQUIREMENTS INCLUDED
3. GENERAL
4. MATERIALS
5. TEMPORARY ELECTRICITY AND LIGHTING
6. TEMPORARY TELEPHONE SERVICE
7. TEMPORARY WATER
8. TEMPORARY SANITARY FACILITIES
9. CONSTRUCTION AIDS
10. BARRIERS
11. HEAT, VENTILATION
12. ENCLOSURES
13. PROTECTION OF INSTALLED WORK
14. WATER CONTROL
15. CLEANING DURING CONSTRUCTION
16. PROJECT IDENTIFICATION
17. FIELD OFFICES AND SHEDS
18. REMOVAL OF CONSTRUCTION FACILITIES AND RESTORATION OF SITE
19. SECURITY
20. ACCESS ROADS AND PARKING AREAS
21. TEMPORARY CONTROLS
22. TRAFFIC REGULATION

**ARTICLE 1: GENERAL PROVISIONS**

- 1.1 The general provisions of the Contract, including the conditions of the Contract (General Conditions, Supplementary General Conditions, General Requirements, and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

**ARTICLE 2: REQUIREMENTS INCLUDED**

- 2.1 Temporary Electricity and Lighting
- 2.2 Temporary Telephone Service
- 2.3 Temporary Water
- 2.4 Temporary Sanitary Facilities
- 2.5 Construction Aids
- 2.6 Barriers
- 2.7 Temporary Heat and Ventilation
- 2.8 Temporary Enclosures
- 2.9 Protection of Installed Work
- 2.10 Water Control
- 2.11 Cleaning During Construction
- 2.12 Project Identification
- 2.13 Field Offices and Sheds
- 2.14 Removal of Construction Facilities and Restoration of Site
- 2.15 Security
- 2.16 Access Roads and Parking Areas
- 2.17 Temporary Controls
- 2.18 Traffic Regulation

**ARTICLE 3: GENERAL**

- 3.1 Comply with National Electric Code.
- 3.2 Comply with Federal, State and local codes and regulations and with utility company requirements.
- 3.3 Coordinate Work with Owner's requirements.

**ARTICLE 4: MATERIALS**

- 4.1 Materials must be new and must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

**ARTICLE 5: TEMPORARY ELECTRICITY AND LIGHTING**

- 5.1 Provide temporary electric power and power distribution system as needed to perform the Work.

**ARTICLE 6: TEMPORARY TELEPHONE SERVICE**

- 6.1 Provide telephone service as necessary to properly conduct the Work and to comply with applicable regulations.

**ARTICLE 7: TEMPORARY WATER**

- 7.1 Provide potable water for drinking and construction purposes.
- 7.2 The Contractor shall make all necessary arrangements for temporary water service for construction purposes, and furnish at his own expense all piping and accessories required.
- 7.3 Take positive measures to preclude cross-connections and backflow.
- 7.4 The Contractor will assume the cost of water consumed if responsible care and restraint are not exercised by the Contractor in its use.

**ARTICLE 8: TEMPORARY SANITARY FACILITIES**

- 8.1 Provide sanitary facilities in compliance with laws and regulations.
- 8.2 Service, clean and maintain facilities and enclosures.

**ARTICLE 9: CONSTRUCTION AIDS**

- 9.1 Each Subcontractor shall provide construction aids and equipment required by his personnel and to facilitate execution of his Work. Examples are scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment.
- 9.2 Mutual use may be arranged by the Contractor where applicable.

**ARTICLE 10: BARRIERS**

- 10.1 Materials at Contractor's option, as appropriate to serve required purpose.

**ARTICLE 11: HEAT, VENTILATION**

(Not Used)

**ARTICLE 12: ENCLOSURES**

(Not Used)

**ARTICLE 13: PROTECTION OF INSTALLED WORK**

- 13.1 Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.
- 13.2 Prohibit traffic and storage on waterproofed and roofed surfaces, on lawn and landscaped areas.

**ARTICLE 14: WATER CONTROL**

- 14.1 Maintain excavations free of water. Provide and operate pumping equipment. Grade site to drain.

**ARTICLE 15: CLEANING DURING CONSTRUCTION**

- 15.1 Control accumulation of waste materials and rubbish; periodically dispose of legally off site.
- 15.2 Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

**ARTICLE 16: PROJECT IDENTIFICATION**

(Not Used)

**ARTICLE 17: FIELD OFFICES AND SHEDS**

- 17.1 Field offices and sheds are to be provided by the Contractor as necessary to properly conduct the Work and associated activities such as progress meetings, maintaining as-built drawings, and storage of materials.

**ARTICLE 18: REMOVAL OF CONSTRUCTION FACILITIES AND RESTORATION OF SITE**

- 18.1 Remove temporary materials, equipment, services, and construction prior to Substantial Completion Inspection.
- 18.2 Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of two (2) feet; grade site as indicated.

**ARTICLE 19: SECURITY**

- 19.1 Security of persons and property in areas under control of the Contractor shall be the Contractor's exclusive responsibility.
- 19.2 The Contractor, at this own expense, shall initiate whatever programs that are necessary to execute his responsibility.
- 19.3 Control of access to the areas under his control shall be maintained. Visitors shall be required to report immediately to the Contractor's Superintendent and to produce full identification which will be recorded in the Contractor's Daily Log, along with the purpose of the visit.

**ARTICLE 20: ACCESS ROADS AND PARKING AREAS**

- 20.1 Provide and maintain uninterrupted vehicular access to site and within it:
- .1 To temporary construction facilities, storage and work areas.
  - .2 For use by persons and equipment involved in construction of project.
- 20.2 Maintain traffic areas free as possible of excavated materials, construction equipment, products, snow, ice and debris.
- 20.3 Keep fire hydrants and water control valves free from obstruction and accessible for use.
- 20.4 Designated areas of existing parking facilities may be used for parking of construction personnel's private vehicles and of Contractor's light-weight vehicles.

**ARTICLE 21: TEMPORARY CONTROLS**

- 21.1 Provide the following Temporary Controls:
- .1 Control of noise.
  - .2 Control of dust, both on site and within building.
  - .3 Control of surface water to prevent damage to the project, the site or adjacent properties.
  - .4 Control of pests and rodents to prevent infestation of construction or storage areas.
  - .5 Control of debris.
  - .6 Control of pollution of soil, water or atmosphere in accordance with applicable laws.
  - .7 Control of erosion in accordance with applicable laws.
  - .8 Control of mud and snow, including removal where necessary to construction operations.  
Remove any mud tracked from site onto public roads or streets.

**ARTICLE 22: TRAFFIC REGULATION**

- 22.1 Obtain all temporary permits for access to, and use of public roads and streets for construction and hauling purposes. Comply with traffic control regulations applying to permit issuance.
- 22.2 Provide all markers, signs, lights and barriers on, and near the site to safely control construction traffic and public access.

END OF SECTION 01500 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

**SECTION 01600 - MATERIALS AND EQUIPMENT****TABLE OF ARTICLES**

1. GENERAL CONDITIONS
2. REQUIREMENTS INCLUDED
3. MANUFACTURER'S INSTRUCTIONS
4. TRANSPORTATION AND HANDLING
5. STORAGE AND PROTECTION
6. SUBSTITUTIONS AND PRODUCT OPTIONS

**ARTICLE 1: GENERAL CONDITIONS**

- 1.1 The general provisions of the Contract, including the conditions of the Contract (General Conditions, Supplementary General Conditions, General Requirements, and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- 1.2 Where Work is to be executed under Separate Prime Contracts, the provisions of this Section apply to each contract.

**ARTICLE 2: REQUIREMENTS INCLUDED**

- 2.1 All material and equipment incorporated into the Work shall:
  - .1 Conform to applicable specifications and standards.
  - .2 Comply with size, make, type and quality specified, or as specifically approved in writing by the Architect.
- 2.2 Manufactured and Fabricated Products shall conform to the following requirements:
  - .1 Design, fabricate and assemble in accordance with the best engineering and shop practices.
  - .2 Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
  - .3 Two or more items of the same kind shall be identical, by the same manufacturer.
  - .4 Products shall be suitable for service conditions.
  - .5 Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
- 2.3 Do not use material or equipment for any purpose other than that for which it is designated or is specified.
- 2.4 Materials removed from existing structures shall not be re-used in the completed Work unless specifically indicated or specified.
- 2.5 For material and equipment specifically indicated or specified to be re-used in the Work:
  - .1 Use special care in removal, handling, storage and reinstallation, to assure proper function

in the completed Work.

- .2 Arrange for transportation, storage and handling of products which require off-site storage, restoration or renovation. Pay all costs for such work.

### **ARTICLE 3: MANUFACTURER'S INSTRUCTIONS**

- 3.1 When Contract Documents require that installation of Work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to Engineer.
  - .1 Maintain one set of complete instructions at the job site during installation and until completion.
- 3.2 Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
  - .1 Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions.
  - .2 Do not proceed with Work without clear instructions.
- 3.3 Perform Work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

### **ARTICLE 4: TRANSPORTATION AND HANDLING**

- 4.1 Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with Work and conditions at the site.
  - .1 Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
  - .2 Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.
- 4.2 Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

### **ARTICLE 5: STORAGE AND PROTECTION**

- 5.1 Store products in accord with manufacturer's instructions, with seals and labels intact and legible.
  - .1 Store products subject to damage by the elements in weather-tight enclosures.
  - .2 Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- 5.2 Exterior Storage.
  - .1 Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
  - .2 Store loose granular materials in a well-drained area on solid surfaces to prevent mixing

with foreign matter.

- 5.3 Arrange storage in a manner to provide easy access for inspection. Make periodic inspection of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.
- 5.4 Store flammable materials so as to prevent contact with flames and fire. Conform with manufacturer's recommendations and local laws. Pay particular attention to storage of:
  - .1 Paint materials.
  - .2 Cleaning and other solvents.
  - .3 Fuels.
- 5.5 Protection After Installation:
  - .1 Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

#### **ARTICLE 6: SUBSTITUTIONS AND PRODUCT OPTIONS**

- 6.1 Product List.
  - .1 Within 14 days after date of Owner-Contractor Agreement, submit a complete list of major products proposed for use, with the name of the manufacturer, trade name, and model number of each product and the installing subcontractor.
- 6.2 Contractor's Options.
  - .1 For products specified only by reference standard, select any product meeting that standard.
  - .2 For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with the specifications.
  - .3 For products specified by naming one or more products or manufacturers and "or equal", bidders must, during the bidding period, submit a request for substitutions for any product or manufacturer not specifically named. See provisions in Article 6, paragraph 6.3.
  - .4 For products specified by naming only one product and manufacturer, there is no option.
- 6.3 Substitutions.
  - .1 Requests for substitutions shall be made in writing and received by the Owner before 4:30 p.m., 10 calendar days prior to bid opening. Subsequently, substitutions will be considered only when a Product becomes unavailable due to no fault of the Contractor. The Architect will review requests and will notify bidders in an Addendum if the requested substitution is acceptable.
  - .2 Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:
    - .1 Comparison of the qualities of the proposed substitution with that specified.
    - .2 Changes required in other elements of the work because of the substitution.
    - .3 Effect on the construction schedule.
    - .4 Cost data comparing the proposed substitution with the product specified.
    - .5 Any required license fees or royalties.

- .6 Availability of maintenance service, and source of replacement materials.
- .3 Engineer shall be the judge of the acceptability of the proposed substitution.
- .4 A request for a substitution constitutes a representation that Bidder:
  - .1 Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.
  - .2 Will provide the same warranties or bonds for the substitution as for the product specified.
  - .3 Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects.
  - .4 Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

END OF SECTION 01600 – MATERIALS AND EQUIPMENT

**SECTION 01700 - CONTRACT CLOSEOUT****TABLE OF ARTICLES**

1. REQUIREMENTS INCLUDED
2. RELATED REQUIREMENTS
3. CLOSEOUT PROCEDURES
4. FINAL CLEANING
5. OPERATION AND MAINTENANCE DATA
6. WARRANTIES AND BONDS
7. SPARE PARTS AND MAINTENANCE MATERIALS

**ARTICLE 1: REQUIREMENTS INCLUDED**

- 1.1 Closeout Procedures.
- 1.2 Final Cleaning.
- 1.3 Operation and Maintenance Data.
- 1.4 Warranties and Bonds.
- 1.5 Spare Parts and Maintenance Materials.

**ARTICLE 2: RELATED REQUIREMENTS**

- 2.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, General Requirements, and other Division-1 Specification Sections, apply to this Section.
  - .1 Fiscal provisions, legal submittals, and other administrative requirements.
- 2.2 Section 00600 - Bonds, Certificates and Administrative Forms (AIA Documents), applies to this Section.

**ARTICLE 3: CLOSEOUT PROCEDURES**

- 3.1 Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.
- 3.2 When Contractor considers Work has reached final completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Owner's inspection.
- 3.3 In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
- 3.4 Owner will issue a final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order.

**ARTICLE 4: FINAL CLEANING**

- 4.1 Execute prior to final inspection.
- 4.2 Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum soft surfaces. Clean equipment and

fixtures to a sanitary condition, clean or replace filters of mechanical equipment. Clean roofs, gutters, downspouts, and drainage systems.

- 4.3 Clean site: Sweep paved areas, rake clean other surfaces.
- 4.4 Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the Site. Provide final cleaning.

#### **ARTICLE 5: OPERATION AND MAINTENANCE DATA**

- 5.1 Provide data for:
  - .1 Mechanical equipment and controls.
  - .2 Electrical equipment and controls.
- 5.2 Submit three (3) sets prior to final inspection, bound in 8-1/2 x 11 inch (216 x 279 mm) three-ring side binders with durable plastic covers.
- 5.3 Provide a separate volume for each system, with a table of contents and index tabs for each volume.
- 5.4 Part 1: Directory, listing names, addresses, and telephone number of: Suppliers and Contractor.
- 5.5 Part 2: Operation and maintenance instructions, arranged by Specification Division. For each Specification give names, addresses, and telephone number of Subcontractors and Suppliers.

List:

- .1 Appropriate design criteria.
- .2 List of equipment.
- .3 Parts list.
- .4 Operating instructions.
- .5 Maintenance instructions, equipment.
- .6 Maintenance instructions, finishes.
- .7 Shop Drawings and Product Data.
- .8 Warranties.

#### **ARTICLE 6: WARRANTIES AND BONDS**

- 6.1 Provide duplicate, notarized copies. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.
- 6.2 Submit material prior to final application for payment. For equipment put into use with Owner's written permission during construction, submit within seven (7) days after first operation. For items of work delayed materially beyond date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

#### **ARTICLE 7: SPARE PARTS AND MAINTENANCE MATERIALS**

- 7.1 Provide products, spare parts, and maintenance materials in quantities specified in each Section, in addition to that used for construction of Work. Coordinate with Owner, deliver to Project Site and obtain receipt prior to final payment.

END OF SECTION 01700 - CONTRACT CLOSEOUT

## **SECTION 01720 - PROJECT RECORD DOCUMENTS**

### **TABLE OF ARTICLES**

1. REQUIREMENTS INCLUDED
2. MAINTENANCE OF DOCUMENTS AND SAMPLES
3. MARKING DEVICES
4. RECORDING
5. SUBMITTAL

### **ARTICLE 1: REQUIREMENTS INCLUDED**

- 1.1 Maintain at the site for the Owner one (1) record copy of:
  - .1 Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other Modifications to the Contract.
  - .5 Engineer Field Orders or Written Instructions.
  - .6 Approved Shop Drawings, Product Data and Samples.
  - .7 Field Test Records.

### **ARTICLE 2: MAINTENANCE OF DOCUMENTS AND SAMPLES**

- 2.1 Store documents and samples in Contractor's field office apart from documents used for construction.
- 2.2 File documents and samples in accordance with CSI format.
- 2.3 Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- 2.4 Make documents and samples available at all times for inspection by Owner's representative.

### **ARTICLE 3: MARKING DEVICES**

- 3.1 Provide felt tip marking pens for recording information in the code designated by Owner's representative.

### **ARTICLE 4: RECORDING**

- 4.1 Label each document "PROJECT RECORD" in neat large printed letters.
- 4.2 Record information concurrently with construction progress.
  - .1 Do not conceal any work until required information is recorded.
- 4.3 Drawings: Legibly mark to record actual construction:
  - .1 Depths of various elements of foundation in relation to finish first floor datum.
  - .2 Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

- .3 Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by Change Order.
  - .6 Details not on original Contract Drawings.
- 4.4 Specifications and Addenda: Legibly mark each Section to record:
- .1 Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  - .2 Changes made by Change Order.

**ARTICLE 5: SUBMITTAL**

- 5.1 Prior to contract close-out, Contractor shall submit record documents as specified for Owner's review and acceptance, Contractor shall submit a set of reproducible sepias for Owner's use.
- 5.2 Accompany submittal with transmittal letter in duplicate, containing:
- .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Title and number of each record document.
  - .5 Signature of Contractor or his authorized representative.

END OF SECTION 01720 – PROJECT RECORD DOCUMENTS

## SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT

### PART 1 – GENERAL

#### 1.1 SUMMARY

- A. Section includes: Administrative and procedural requirements for construction waste management activities.

#### 1.2 DEFINITIONS

- A. Construction, Demolition, and Land clearing (CDL) Waste: Includes all non-hazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition and land clearing. Includes material that is recycled, reused, salvaged or disposed as garbage.
- B. Salvage: Recovery of materials for on-site reuse, sale or donation to a third party.
- C. Reuse: Making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. Examples include, but are not limited to the following: Crushing or grinding of concrete for use as sub-base material. Chipping of land clearing debris for use as mulch.
- D. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product.
- E. Source-Separated CDL Recycling: The process of separating recyclable materials in separate containers as they are generated on the job-site. The separated materials are hauled directly to a recycling facility or transfer station.
- F. Co-mingled CDL Recycling: The process of collecting mixed recyclable materials in one container on-site. The container is taken to a material recovery facility where materials are separated for recycling.
- G. Approved Recycling Facility: Any of the following:
  - 1. A facility that can legally accept CDL waste materials for the purpose of processing the materials into an altered form for the manufacture of a new product.
  - 2. Material Recovery Facility: A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures, are used to recover recyclable materials.

#### 1.3 SUBMITTALS

- A. Contractor shall develop a Waste Management Plan: Submit 3 copies of plan within 14 days of date established for the **Notice to Proceed**.
- B. Contractor shall provide Waste Management Report: Concurrent with each Application for Payment, submit **3** copies of report.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Divert a minimum of **75%** CDL waste, by weight, from the landfill by one, or a combination of the following activities:
1. Salvage
  2. Reuse
  3. Source-Separated CDL Recycling
  4. Co-mingled CDL Recycling
- B. CDL waste materials that can be salvaged, reused or recycled include, but are not limited to, the following:
1. Acoustical ceiling tiles
  2. Asphalt
  3. Asphalt shingles
  4. Cardboard packaging
  5. Carpet and carpet pad
  6. Concrete
  7. Drywall
  8. Fluorescent lights and ballasts
  9. Land clearing debris (vegetation, stumpage, dirt)
  10. Metals
  11. Paint (through hazardous waste outlets)
  12. Wood
  13. Plastic film (sheeting, shrink wrap, packaging)
  14. Window glass
  15. Wood
  16. Field office waste, including office paper, aluminum cans, glass, plastic, and office cardboard.

#### 1.4 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED Accredited Professional, certified by the USGBC as waste management coordinator.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Regulatory Requirements: Conduct construction waste management activities in accordance with hauling and disposal regulations of all authorities having jurisdiction and all other applicable laws and ordinances.
- D. Preconstruction Conference: Schedule and conduct meeting at Project site prior to construction activities.
1. Attendees: Inform the following individuals, whose presence is required, of date and time of meeting.
    - a. Owner
    - b. Architect
    - c. Contractor's superintendent
    - d. Major subcontractors
    - e. Waste Management Coordinator
    - f. Other concerned parties

2. Agenda Items: Review methods and procedures related to waste management including, but not limited to, the following:
  - a. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
  - b. Review requirements for documenting quantities of each type of waste and its disposition.
  - c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - e. Review waste management requirements for each trade.
3. Minutes: Record discussion. Distribute meeting minutes to all participants.  
Note: If there is a Project Architect, they will perform this role.

1.5 WASTE MANAGEMENT PLAN – Contractor shall develop and document the following:

- A. Develop a plan to meet the requirements listed in this section at a minimum. Plan shall consist of waste identification, waste reduction plan and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight throughout the plan.
- B. Indicate anticipated types and quantities of demolition, site-cleaning and construction waste generated by the project. List all assumptions made for the quantities estimates.
- C. List each type of waste and whether it will be salvaged, recycled, or disposed of in a landfill. The plan should include the following information:
  1. Types and estimated quantities, by weight, of CDL waste expected to be generated during demolition and construction.
  2. Proposed methods for CDL waste salvage, reuse, recycling and disposal during demolition including, but not limited to, one or more of the following:
    - a. Contracting with a deconstruction specialist to salvage materials generated,
    - b. Selective salvage as part of demolition contractor's work,
    - c. Reuse of materials on-site or sale or donation to a third party.
  3. Proposed methods for salvage, reuse, recycling and disposal during construction including, but not limited to, one or more of the following:
    - a. Requiring subcontractors to take their CDL waste to a recycling facility;
    - b. Contracting with a recycling hauler to haul recyclable CDL waste to an approved recycling or material recovery facility;
    - c. Processing and reusing materials on-site;
    - d. Self-hauling to a recycling or material recovery facility.
  4. Name of recycling or material recovery facility receiving the CDL wastes.
  5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on project site where materials separation will be located.

- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
1. Total quantity of waste.
  2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
  3. Total cost of disposal (with no waste management).
  4. Revenue from salvaged materials.
  5. Revenue from recycled materials.
  6. Savings in hauling and tipping fees by donating materials.
  7. Savings in hauling and tipping fees that are avoided.
  8. Handling and transportation costs. Including cost of collection containers for each type of waste.
  9. Net additional cost or net savings from waste management plan.

## PART 2 - PRODUCTS (Not Used)

## PART 3 – EXECUTION

### 3.1 CONSTRUCTION WASTE MANAGEMENT, GENERAL

- A. Provide containers for CDL waste that is to be recycled clearly labeled as such with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.
- B. The collection containers for recyclable CDL waste must contain no more than 10% non-recyclable material, by volume.
- C. Provide containers for CDL waste that is disposed in a landfill clearly labeled as such.
- D. Use detailed material estimates to reduce risk of unplanned and potentially wasteful cuts.
- E. To the greatest extent possible, include in material purchasing agreements a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back for reuse or recycling, and to take back all unused product. Insure that subcontractors require the same provisions in their purchase agreements.
- F. Conduct regular visual inspections of dumpsters and recycling bins to remove contaminants.

### 3.2 SOURCE SEPARATION

- A. General: Contractor shall separate recyclable materials from CDL waste to the maximum extent possible.

Separate recyclable materials by type.

1. Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water and to minimize pest attraction. Cover to prevent windblown dust.

3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from weather.

### 3.3 CO-MINGLED RECYCLING

- A. General: Do not put CDL waste that will be disposed in a landfill into a co-mingled CDL waste recycling container.

### REMOVAL OF CONSTRUCTION WASTE MATERIALS

- A. Remove CDL waste materials from project site on a regular basis. Do not allow CDL waste to accumulate on-site.
- B. Transport CDL waste materials off Owner's property and legally dispose of them.
- C. Burning of CDL waste is not permitted.

<b>WASTE MANAGEMENT PROGRESS REPORT</b>				
<b>MATERIAL CATEGORY</b>	<b>DISPOSED IN MUNICIPAL SOLID WASTE LANDFILL</b>	<b>DIVERTED FROM LANDFILL BY RECYCLING, SALVAGE OR REUSE</b>		
		Recycled	Salvaged	Reused
1. Acoustical Ceiling Tiles				
2. Asphalt				
3. Asphalt Shingles				
4. Cardboard Packaging				
5. Carpet and Carpet Pad				
6. Concrete				
7. Drywall				
8. Fluorescent Lights and Ballasts				
9. Land Clearing Debris (vegetation, stumpage, dirt)				
10. Metals				
11. Paint (through hazardous waste outlets)				
12. Wood				
13. Plastic Film (sheeting, shrink wrap, packaging)				
14. Window Glass				
15. Field Office Waste (office paper, aluminum cans, glass, plastic, and coffee cardboard)				
16. Other (insert description)				
17. Other (insert description)				
Total (In Weight)		(TOTAL OF ALL ABOVE VALUES – IN WEIGHT)		
		Percentage of Waste Diverted	(TOTAL WASTE DIVIDED BY TOTAL DIVERTED)	

END OF SECTION

**SECTION 02150 - SEWAGE BYPASS PUMPING**

## PART 1 GENERAL

## 1.01 SCOPE

- A. The Contractor is required to furnish all materials, labor, equipment, power, maintenance, etc. to implement a temporary pumping system for the purpose of diverting the existing flow around the work area to complete the work of the proposed project.
- B. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- C. When bypass pumping, a sound attenuated pumping unit capable of producing no more than 70 dBA @ 30 feet will be required. The Owner's pre-approval is required for bypass pumping between the hours of 8 PM and 7 AM,

## 1.02 SUBMITTALS

- A. The Contractor shall prepare a specific, detailed description of the proposed pumping system and submit it to the Engineer for approval at least two weeks prior to the initiation of bypass pumping.
- B. The Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flow. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these Contract Documents. No construction shall begin until all provisions and requirements have been reviewed by the Engineer.
- C. The plan shall include but not limited to details of the following:
  - 1. Staging areas for pumps;
  - 2. Sewer plugging method and types of plugs;
  - 3. Number, size, material, location and method of installation of suction piping;
  - 4. Number, size, material, method of installation and location of installation of discharge piping;
  - 5. Bypass pump sizes, capacity, number of each size to be on site and power requirements;
  - 6. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted); Estimated system curves shall be submitted showing multiple pump applications.
  - 7. Downstream discharge plan;
  - 8. Method of protecting discharge manholes or structures from erosion and damage;
  - 9. Thrust and restraint block sizes and locations;
  - 10. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
  - 11. Method of noise control for each pump and/or generator;
  - 12. Any temporary pipe supports and anchoring required;
  - 13. Design plans and computation for access to bypass pumping locations indicated on the drawings;
  - 14. Calculations for selection of bypass pumping pipe size;
  - 15. Schedule for installation of and maintenance of bypass pumping lines;

16. Plan indicating selection location of bypass pumping line locations.

## PART 2 PRODUCTS

### 2.01. Equipment

- A. All pumps used shall be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in the priming system. The pumps shall be diesel powered. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows.
- B. The Contractor shall provide the necessary automatic stop/start controls for each pump.
- C. The Contractor shall include one stand-by pump of each size to be maintained on site. Back up pumps shall be on line but isolated from the primary system by a valve.
- D. Discharge Piping - In order to prevent the accidental spillage of flows all discharge systems shall be temporarily constructed of rigid pipe with positive, restrained joints. Under no circumstances will aluminum "irrigation" type piping be allowed. Discharge hose will only be allowed in short sections and by specific permission from the engineer.

### 2.02 System Description

#### A. Design Requirements:

1. Bypass pumping systems shall have sufficient capacity to pump a peak flow. The Contractor shall provide all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the main can be safely diverted around the section to be repaired. Bypass pumping system may be required to be operated 24 hours per day depending on the work activity.
2. The Contractor shall have adequate standby equipment installed and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each pump utilized shall be installed at the bypass pumping locations, ready for use in the event of primary pump failure.
4. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow up to full available flow into the work area as necessary for satisfactory performances of work.
5. The Contractor shall make all arrangements for bypass pumping during the time when the main is shut down for any reason. System must overcome any existing force main pressure on discharge.
6. **All lateral connections will be treated in the same manner as mainline sewers. Each will have a temporary sump and a pump and stand-by pump to transfer flows to a mainline manhole if required to complete the work.**

#### B. Performance Requirements:

1. It is essential to the operation of the existing sewerage system that there be no interruption in the flow of sewage throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to

intercept the sewage flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the existing sewer downstream of his work.

2. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
3. The Contractor shall provide all necessary means to safely convey the sewage past the work area. The Contractor will not be permitted to stop or impede the main line and lateral flows under any circumstances.
4. The Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.
5. The Contractor shall protect water resources, wetlands and other natural resources.

### PART 3 EXECUTION

#### 3.01 FIELD QUALITY CONTROL AND MAINTENANCE

##### A. Test:

1. The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. The Engineer will be given 24 hours notice prior to testing.

##### B. Inspection:

1. Contractor shall inspect bypass pumping system continuously throughout the course of the work to ensure that the system is working correctly.

##### C. Maintenance Service:

1. The Contractor shall insure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.

##### D. Extra Materials:

1. Spare parts for pumps and piping shall be kept on site as required.
2. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

#### 3.02 PREPARATION

##### A. Precautions

1. Contractor is responsible for locating any existing utilities in the area the Contractor selects to place the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the Owner and the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.
2. During all bypass pumping operation, the Contractor shall protect the Pumping Station, lateral pipes, sewer main and all local sewer lines from damage inflicted by any

equipment. The Contractor shall be responsible for all physical damage to lateral pipes, the main and all local sewer lines caused by human or mechanical failure.

3.03 INSTALLATION AND REMOVAL

- A. The Contractor shall remove manhole sections or make connections to the existing sewer and construct temporary bypass pumping structures as may be required to provide an adequate suction conduit for the bypass pump.
- B. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- C. When working inside manhole or force main, the Contractor shall exercise caution and comply with OSHA requirements.
- D. The installation of the bypass pipelines is prohibited in all saltmarsh/wetland areas. The pipeline must be located off streets, sidewalks and on shoulder of the roads. When the bypass pipeline crosses local streets and private driveways, the contractor must place the bypass pipelines in trenches and cover with plating or temporary pavement. Upon completion of the bypass pumping operations, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement. The Contractor is responsible for obtaining any approvals for placement of the temporary pipeline within public ways from the agency with jurisdiction.

END OF SECTION 02150 – SEWAGE BYPASS PUMPING

**SECTION 02210 – SUBSURFACE UTILITY INVESTIGATION AND LOCATION**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Investigative work required to determine the precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement and recording of the location of a subsurface utility.
- B. Non destructive excavation to expose and verify the location of existing buried facilities.

## 1.02 FIELD MEASUREMENTS

- A. Verify that survey information related to the horizontal and vertical location of existing utilities is recorded and submitted to the Engineer

## 1.03 REFERENCE STANDARDS

- A. CI/ASCE 38-02: "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," American Society of Civil Engineers, 2003. QL A: Utility Quality Level A. QL A indicates the precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point.

## 1.04 WORK LOCATIONS

- A. Contractor shall use surface geophysical methods to locate and verify the location of existing utilities in areas scheduled for the open cut removal and replacement or abandonment of existing sanitary sewer pipe and manholes and/or as designated by the Engineer.

## 1.05 SUBMITTALS

- A. Name and qualifications of the firm selected to investigate and record the location of existing facilities. The selected firm shall be regularly engaged in the business of utility location and shall be able to demonstrate this experience.
- B. All required reports, documentation, studies, field notes and sketches, plan drawings, and electronic data shall be submitted for review and acceptance by the Engineer.

## PART 2 PRODUCTS

Not used

## PART 3 EXECUTION

## 3.01 PREPARATION

- A. Deploy necessary personnel, equipment, and supplies to the work site, in preparation for the work.
- B. Whenever the work will affect the movement of traffic or traffic safety, provide traffic control and utilize traffic control devices necessary to maintain at least one lane of the roadway to vehicular traffic at all times.

in conformance with the DeIDOT MUTCD.

- C. Obtain all necessary permits from the State of DE, DOT and/or local jurisdictions to allow the Contractor to work within public rights of way.
- D. Records and Information Research - Conduct appropriate investigations (e.g., owner records, DOT records, County records, personal interviews, visual inspections, etc.), to help identify utility owners that may have facilities within the project limits or that may be affected by the project.
- E. Records Collection - Collect applicable records (e.g., utility owner base maps, "as built" or record drawings, permit records, field notes, geographic information system data, oral histories, etc.) on the existence and approximate location of existing involved utilities.
- F. Records Review - Review records for: evidence or indication of additional available records; duplicate or conflicting information; need for clarification.
- G. Compilation and Presentation of Data. - Transfer information on all involved utilities to appropriate plan sheets, electronic files, and/or other documents as required. Exercise professional judgment to resolve conflicting information.

### 3.02 EXISTING UTILITY MARK OUT

- A. Identify surface features, from project maps (if available) and from field observations, that are surface appurtenances of subsurface utilities.
- B. Select and apply appropriate surface geophysical method(s) to search for and detect subsurface utilities within the project limits, and/or to trace a particular utility line or system.
  - 1. Based on an interpretation of data, mark the indications of utilities on the ground surface, for subsequent survey. Utilize paint or other method acceptable to Engineer for marking of lines.
  - 2. Utilize the uniform color code of the American Public Works Association for marking of utilities.
  - 3. Unless otherwise directed, mark centerline of single-conduit lines, and outside edges of multi-conduit systems.
  - 4. Unless otherwise approved, maintain horizontal accuracy of +/- 1.5 feet (450 mm) in the marking of lines.
  - 5. As an alternative to the physical marking of lines, the Contractor may, with the Engineers approval, utilize other means of data collection, storage, retrieval, and reduction, that enables the correlation of surface geophysical data to the project's survey control.
  - 6. Record locations of all markings that indicate the presence of a subsurface utility.

### 3.03 EXCAVATION

- A. Precise horizontal and vertical location of utilities is required prior to the excavation required to replace existing facilities at the site. The Contractor is required to "test pit" locations based on the requirements of the project and on existing subsurface utility information to accurately record the location of existing underground utilities at the site and assure the utilities are not damaged during construction or as a result of construction.
- B. The Contractor shall comply with all applicable provisions of DE State Law when planning or

performing excavations at utility test hole sites. Compliance actions include, but are not limited to: notify owners or operators of underground utility facilities at least two (2) business days prior (not including the day of actual notice) to making or beginning excavations in the vicinity of such facilities; contact non-member utilities directly; coordinate with utility owner representatives as required for inspection or other on-site assistance; immediately cease excavation work, report any resultant utility line damage to utility owner and conduct the necessary repairs to utilities damaged as a result of excavation at no additional cost to the Owner.

- C. The Contractor shall use minimally intrusive excavation techniques, acceptable to the Engineer, that ensure the safety of the excavation, the integrity of the utility line to be measured, and that of other lines which may be encountered during excavation. The Engineer intends that excavation shall be by means of air- or water-assisted vacuum excavation equipment manufactured specifically for the purpose. Provided, however, that approval of water-assisted vacuum excavation shall pose no risk of damage to the paved facility or utility lines.
1. Clear the test hole area of surface debris.
  2. In paved areas, neatly cut and remove existing pavement.
  3. Excavate the test hole by the method(s) chosen by the Contractor.
  4. Expose the utility only to the extent required for identification and data collection purposes.
  5. Avoid damage to lines, wrappings, coatings, cathodic protection or other protective coverings and features.
  6. Hand-dig as needed to supplement mechanical excavation and to ensure safety.
  7. Revise the test hole location as necessary to positively expose the utility.
  8. Store excavated material for re-use or disposal, as appropriate.
  9. Underpin adjacent structures which may be damaged by excavation work, including utilities and pipe chases.
  10. Comply with all Federal, State and local codes, permits and regulations.
  11. Excavation cut not to interfere with normal 45 degrees bearing splay of foundations or any other adjacent structures or utilities.
  12. Grade top perimeter of excavation to prevent surface water from draining into excavation.
  13. Hand trim excavation. Remove loose matter.
  14. Remove lumped subsoil, boulders and rock at no extra cost to the Owner.
  15. Notify Engineer of unexpected subsurface conditions or utility damage.
  16. Correct unauthorized excavation at no extra cost to Owner.
  17. Correct areas over-excavated by error.
  18. Remove overburden / spoils from the site and dispose of in accordance with State and Local regulations.

19. Excavations shall be kept dewatered by such methods as the Contractor deems necessary. Where pumping is required, a sufficient number of pumps of adequate size shall be employed to keep the excavations dry and free of water at all times during excavation, and until the work is completed. Sumps shall be constructed where necessary. Water removed from excavations shall be directed to a sediment bag, or other approved device, and shall be disposed of in such a manner as to not cause injury to public health, private property, street surfaces, embankments or to any portion of the work completed or in progress.
20. Support excavations with sheathing, shoring and bracing or with a "trench box" as required to comply with OSHA regulations.
21. Install adequate excavation supports to prevent ground movement or settlement to adjacent structures, pipelines or utilities. Damage due to settlement because of failure to provide support or through fault of the Contractor in any other manner, shall be repaired at the Contractor's expense.
22. Withdraw excavation supports when work is complete.

### 3.04 COLLECTION, RECORDING, AND PRESENTATION OF DATA.

- A. Measure and/or record the following information on an appropriately formatted test hole data sheet that has been sealed and prepared by the Contractor.
  1. Elevation of top and/or bottom of the utility tied to the project datum, to a vertical accuracy of +/- 0.05 feet (15 mm).
  2. Elevation of existing grade over utility at test hole.
  3. Horizontal location referenced to project coordinate datum, to a horizontal accuracy consistent with applicable DOT survey standards.
  4. Field sketch showing horizontal location referenced to a minimum of three (3) swing ties to physical structures existing in the field and shown on the project plans.
  5. Approximate centerline bearing of utility line.
  6. Outside diameter of pipe, width of duct banks, and configuration of non-encased multi-conduit systems.
  7. Utility structure material composition, when reasonably ascertainable.
  8. Identity of benchmarks used to determine elevations.
  9. Other pertinent information as is reasonably ascertainable from test hole.

### 3.05 SITE RESTORATION

- A. Backfill excavation and restore the area disturbed.
  1. Replace bedding material around exposed utility lines in accordance with owner's specifications or as otherwise directed or approved.
  2. Backfill and compact the excavation in a manner acceptable to Engineer. If approved, re-use excavated material with appropriate moisture/density control.
  3. Install color-coded warning ribbon within the backfill area and directly above the utility line.

4. As applicable, provide permanent pavement restoration within the limits of the original cut using materials, compaction, and pavement thickness shown on the Contract Details attached to the Contract Documents.
5. Repair or replace backfill or pavement that fails (i.e., subsidence and/or loss of pavement material) in accordance with the Warranty period required in the Contract Documents.
6. For excavations in unpaved areas, restore disturbed area as nearly as practicable to pre-existing conditions and in conformance to the restoration requirements of the Contract Documents.

END OF SECTION 02210 – SUBSURFACE UTILITY INVESTIGATION AND LOCATION

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**SECTION 02222 - EXCAVATION**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Excavation for the installation of new sewer main pipe, lateral pipe, spot repairs clean outs.
- B. Excavation for slabs-on-grade, paving, landscaping.
- C. Excavation for replacement of manholes, manhole cone sections, manhole frames and covers.
- D. Excavation for utility installation or repair.

## 1.02 FIELD MEASUREMENTS

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

## PART 2 PRODUCTS

Not used

## PART 3 EXECUTION

## 3.01 PREPARATION

- A. Identify required lines, levels, contours and datum.

## 3.02 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation work, including utilities and pipe chases.
- B. Excavate subsoil required to accommodate pipes, building foundations, slabs-on-grade, paving and site structures as shown on the Drawings.
- C. Comply with all Federal, State and local codes, permits and regulations.
- D. Excavation cut not to interfere with normal 45 degrees bearing splay of foundations or any other adjacent structures or utilities.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Hand trim excavation. Remove loose matter.
- G. Remove lumped subsoil, boulders and rock at no extra cost to the Owner.
- H. Notify Engineer of unexpected subsurface conditions or utility damage.
- I. Correct unauthorized excavation at no extra cost to Owner.
- J. Correct areas over-excavated by error.
- K. Remove overburden / spoils from the site and dispose of in accordance with State and Local

regulations.

- L. Excavations shall be kept dewatered by such methods as the Contractor deems necessary. Where pumping is required, a sufficient number of pumps of adequate size shall be employed to keep the excavations dry and free of water at all times during excavation, and until the work is completed. Sumps shall be constructed where necessary. Water removed from excavations shall be directed to a sediment bag, or other approved device, and shall be disposed of in such a manner as to not cause injury to public health, private property, street surfaces, embankments or to any portion of the work completed or in progress.
- M. Support excavations with sheathing, shoring and bracing or with a "trench box" as required to comply with OSHA regulations.
- N. Install adequate excavation supports to prevent ground movement or settlement to adjacent structures, pipelines or utilities. Damage due to settlement because of failure to provide support or through fault of the Contractor in any other manner, shall be repaired at the Contractor's expense.
- O. Withdraw excavation supports when work is complete.

3.03 FIELD QUALITY CONTROL

- A. Provide for visual inspection of bearing surfaces.

3.04 PROTECTION

- A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation, from freezing.

END OF SECTION 02222 – EXCAVATION

**SECTION 02223 - BACKFILLING**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Manhole, clean out or utility trench backfilling to subgrade elevations.
- B. Site filling and backfilling.
- C. Fill under slabs-on-grade and paving.
- D. Consolidation and compaction.
- E. Fill for over-excavation.

## 1.02 REFERENCES

- A. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49 kg) Rammer and 12 inch (304.8 mm) Drop. (Standard Proctor).
- B. ANSI/ASTM D1556 – Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ANSI/ASTM D2922 – Test Methods for Density of Soil and Soil aggregate in place by Nuclear methods.

## PART 2 PRODUCTS

## 2.01 FILL MATERIALS

- A. DelDOT Borrow, Type C
- B. AASHTO No. 57 (3/4 inch clean stone).
- C. AASHTO No. 7 clean stone (small pipe bedding).
- D. Graded Aggregate Base Course: Type B, in accordance with Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.
- E. Concrete: Structural concrete with a compressive strength of 4500 psi.

## PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify fill materials to be used meet the requirements of this specification and the details on the project plans. For each material to be used as backfill, whether on-site or borrow, a sample shall be provided to the independent testing agency for proctor analysis at least ten (10) days prior to fill or backfill operations. By submitting samples of these materials, the contractor agrees and guarantees that fill materials actually used in the construction will conform to the accepted samples submitted.

## 3.02 PREPARATION

- A. Generally, compact subgrade to density requirements for subsequent backfill materials.

- B. Cut out soft areas of subgrade not capable of in-situ compaction. Backfill with AASHTO #57 fill material and compact to density equal to or greater than requirements for subsequent backfill material.
- C. Prior to placement of aggregate base course material at paved areas, compact subsoil to 95 percent of its maximum dry density in accordance with ANSI/ASTM D698 unless otherwise specified (DELDOT).

### 3.03 BACKFILLING

- A. Backfill areas to contours and elevations with unfrozen materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- C. Employ a placement method that does not disturb or damage foundation perimeter drainage, foundation damp-proofing, protective covers or utilities in trenches.
- D. Maintain optimum moisture content of backfill materials to attain compaction density of 95% Standard Proctor (ANSI/ASTM D698) beneath paved areas and 90% Standard Proctor outside of roadways.
- E. Backfill against supported structures or utilities.
- F. Backfill simultaneously on each side of unsupported structures or utilities.
- G. Slope grade away from structures minimum 2 inches in 10 ft., unless noted otherwise.
- H. Place and compact materials in continuous 8 inch loose lifts unless otherwise specified.

### 3.04 TOLERANCES

- A. Top Surface of Backfilling: Plus or minus one inch from required elevations.

### 3.05 FIELD QUALITY CONTROL

- A. Field testing will be performed under provisions of Section 01400.
- B. **All backfilling is to be supervised and tested by a Contractor supplied independent, certified testing agency.**
- C. Testing and analysis of fill material shall be performed by the Contractor's Testing Agency in accordance with ANSI/ASTM D1556, ANSI/ASTM D2992, ANSI/ASTM D698 and with Section 01400.
- D. **Frequency of Tests: Contractor shall provide a minimum of one test per lift for every 15 linear feet of trench backfill beneath roadways and every 50 linear feet of trench backfill in other areas. Engineer may call for additional compaction tests on any backfilled material. If the additional test results show the Work does not meet specified requirements, the test shall be at the Contractor's expense and the cost deducted from payments.**
- E. If additional tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

### 3.06 PROTECTION OF FINISHED WORK

- A. Protect finished Work.

END OF SECTION 02223 – BACKFILLING

**SECTION 02500- PAVING**

## PART 1 GENERAL

## 1.01 WORK INCLUDES

- A. The Contractor shall install hot-mix, hot laid asphaltic concrete pavement and base courses in accordance with details provided on the Drawings and specifications.
- B. Work shall include all labor, materials and equipment necessary to perform all paving and surfacing where shown on the contract drawings. The type of material, thickness and typical sections shall be as shown on the Contract Drawings.
- C. Paving associated with manhole frame and cover replacements, test pits, manhole and pipe abandonment, spot repairs, cleanout installations, patching, etc. is incidental to those pay individual items.

## 1.02 QUALITY ASSURANCE

- A. Perform work in accordance with Section 01400.
- B. Specifications: Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.
- C. Source Quality Control: Maintain quality in products by using those of a qualified bituminous concrete producer having qualified plant operating personnel.
- D. Experience: The bituminous concrete producer shall be DELDOT approved and shall be a bulk producer regularly engaged in production of hot-mixed, hot-laid bituminous concrete conforming to the standards referenced herein.
- E. Workmen Qualifications: Provide workmen thoroughly trained and experienced in the skills required who understands the design and is completely familiar with the application of stone base and bituminous concrete paving work.

## 1.03 REFERENCE STANDARDS

- A. Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.

## 1.04 JOB CONDITIONS

- A. Weather Limitations: Apply tack coats only when ambient temperature is above 40° F and rising, and when temperature has not been below 35° F for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct asphaltic concrete surface course (wearing course) only when atmospheric temperature is above 40° F and when base is dry. Binder course may be placed when air temperature is above 35° F and rising.
- C. Grade Control: Establish and maintain required lines and elevations.

## 1.05 SUBMITTALS

- A. Submit work items for review in accordance with Section 01300.
- B. Mix designs for bituminous concrete shall be submitted in writing by the Contractor sufficiently in advance of paving operations to allow for review approval. The design information shall include the following:
  - 1. The use of which the material is proposed.
  - 2. The designation, source and anticipated gradation of each of the component aggregates.
  - 3. The estimated percentage of each aggregate required to yield the desired blend.
  - 4. The resulting percentage passing each sieve size stipulated by the appropriate band.
  - 5. The source of the asphalt material to be used.
- C. Delivery Tickets: Submit for each placed on the project.

## PART 2 PRODUCTS

## 2.01 MATERIALS

- A. The asphalt for the plant mix shall comply with Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition. The asphalt material shall meet the requirements of Division 800. A certificate of compliance will be acceptable.
- B. The mineral aggregate for asphalt plant mix shall consist of coarse aggregate and fine aggregate. The coarse aggregate shall be sound, angular crushed stone, crushed gravel or crushed slag. Uncrushed coarse aggregate may be used in base course mixtures if the mixture meets all the design criteria. The fine aggregate shall be well graded, moderately sharp to sharp sands.
- C. The mineral aggregate and asphalt shall be combined in a mixing plant to meet the gradations for asphalt concrete base and surface, as specified by the Delaware Department of Transportation.

## 2.02 PAVEMENT MIXES

- A. Composition of Mixtures: Binder and wearing course mixture composition shall conform to the requirements of the above referenced specifications and the following.
  - 1. The approved job-mix formula shall lie within the specification limits and be suitable for the layer thickness and other conditions prevailing. It shall not be changed after work has started without the approval of the Engineer.

## PART 3 EXECUTION

## 3.01 GENERAL

- A. Construction requiring the removal and replacement of roads, driveways, parking areas, curb and gutter, walks and paved areas, and new paving shall be as required herein and shall meet the following jurisdictional requirements.
  - 1. Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.

### 3.02 REMOVAL OF EXISTING PAVEMENT

- A. Cut existing pavement in advance of excavating to neat lines.
- B. Saw cut existing pavement to the full depth of paving. Remove transfer devices where they exist.
- C. For walkways and curb and gutter provide temporary facilities as directed by the Engineer.

### 3.03 USE OF STEEL PLATING

- A. Whenever steel plating is required or used during construction within a paved roadway, the following requirements shall apply:
  - 1. Notify Engineer at least 48 hours in advance of placing steel plates in roadway. Unless otherwise approved by the Engineer, steel plates shall be removed in not more than seven days.
  - 2. Provide steel plate warning signs to crossing vehicular traffic.
  - 3. Steel plates shall be at least one inch thick and large enough to allow a minimum of one foot of bearing on all sides of the excavation. Pin plates to prevent movement.
  - 4. Provide cold bituminous mix on all edges of the steel plate tapered from the height of the steel plate extending a minimum of one foot to the existing road surface.
  - 5. During months of the year when snowfall may be expected, mark steel plates with a two inch square stake painted International Orange and extending at least four feet above the ground, placed adjacent to the edge of the roadway.
  - 6. If an emergency condition occurs due to the excavation and plate placement that the Owner's forces must correct, the Contractor will be charged for cost of the corrective measures required.

### 3.04 PREPARATION AND PLACEMENT OF PAVEMENT

- A. All debris, vegetation, or other perishable materials shall be removed from the jobsite, except for trees and shrubs designated for preservation. The site to be paved shall be graded to the required section and all excess material removed from the location of the work. Material in soft spots shall be removed to the depth required to provide a firm foundation and shall be replaced with Type B Backfill material. The entire subgrade area shall be thoroughly compacted to minimum density of 95 percent of the maximum dry density as determined by the Standard Proctor. The surface of the subgrade after compaction shall be hard, uniform, smooth, and true to grade cross-section.
- B. Excavate, replace or adjust as required existing features to assure a smooth transition to proposed paving including but not limited to water valve boxes, manhole frames and covers, etc.
- C. A tack coat shall be applied on the subgrade and base course. The rate of application of the tack coat shall comply with Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.
- D. The Contractor shall provide the necessary equipment, materials, and labor to complete the job acceptable to the owner.
- E. The contractor shall furnish for testing and analysis representative samples to the designated testing laboratory. All materials and applications shall comply with DELDOT Standards. The contractor shall provide certification that the material furnished is in accordance with the contract.

Sampling and testing shall be in accordance with the latest revisions of the American Association of State Highway and Transportation Officials (ASSHTO) or the American Society for Testing Materials (ASTM). A certificate of compliance will be acceptable.

- F. The surface of the completed work when tested with a 10'-0" straight edge shall not have irregularities in excess of 1/4 inch.
- G. For all areas of more than 200 square yards asphalt base and surface courses shall be spread and struck off with a paving machine. Any irregularities in the surface of the pavement course shall be corrected directly behind the paving machine. Excess material forming high spots shall be removed with a shovel or a lute. Indented areas shall be filled with hot mix and smoothed with a lute or the edge of a shovel being pulled over the surface. Casting of mix over such areas shall not be permitted.
- H. If it is impractical to use a paving machine or spread box in areas of less than 200 square yards, asphalt base and surface courses maybe spread and finished by hand. Wood or steel forms rigidly supported to assure correct grade and cross section maybe used. Placing by hand shall be performed carefully to avoid segregation of the mix. Broad casting of material shall not be permitted. Any lumps that do not break down readily shall be removed.
- I. Rolling shall start as soon as hot mix material can be compacted without displacement. Rolling shall continue until thoroughly compacted and all roller marks have disappeared.
- J. In areas too small for the roller a vibrating plate compactor or hand tamper shall be used to achieve thorough compaction.
- K. The contractor shall guarantee in writing the satisfactory performance of the completed pavement for a period of five (5) years.

### 3.05 FIELD QUALITY CONTROL

- A. Thickness: In-place compacted thickness will not be acceptable if exceeding allowable variation from required thickness:
  - 1. Base Course: 1/2", plus or minus.
  - 2. Surface Course: 1/4", plus or minus.
- B. Surface Smoothness: Test finished surface of each asphaltic concrete course for smoothness, using 10 foot straightedge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding following tolerances for smoothness:
  - 1. Base Course Surfaces: 1/4".
  - 2. Wearing Course Surface: 3/16".

### 3.06 PROTECTION

- A. Protect from damage and vehicular traffic until paving has cooled and attained its maximum degree of hardness.

END OF SECTION 02500 – PAVING

**SECTION 02650- SEWER LINE CLEANING**

## PART 1 GENERAL

## 1.01 SCOPE

- A. Work includes the cleaning (including root cutting) of sewer pipes prior to the television inspection of the pipe or as necessary to complete the Work of this Contract. All material removed from the pipe as a result of cleaning must be hauled off site to an area designated by the Contractor and properly disposed of in accordance with applicable codes.
- B. The intent of sewer line cleaning is to remove ALL foreign materials from the lines prior to televising, lining, sealing, etc. the pipe. The success of the other phases of work will depend a great deal on the cleanliness of the lines. The importance of this phase of the operation cannot be over emphasized. Light Cleaning is defined as three or less passes in a pipe segment utilizing High-Velocity Jet (Hydrocleaning) Equipment. It is recognized that there are some conditions such as major blockages that prevent cleaning from being accomplished. The Contractor will be required to inform the Engineer of any major blockage prior to continuing the cleaning of the pipe. If in the course of normal cleaning operations, damage results to the pipe or structure as a result of the cleaning, the Contractor will be required to repair the damage or replace the pipe or structure, at no additional cost to the Owner.

## 1.02 REQUIREMENTS

- A. The Contractor shall be aware that this Contract requires work in active sewers and shall follow all federal, state and local requirements for safety in confined spaces.

## 1.03 RELATED SECTIONS

- A. Temporary Bypass Pumping.
- B. Notifications.

## 1.04 SUBMITTALS

- A. Submit work items for review in accordance with Section 01300.
- B. Proposed equipment to be utilized to accomplish heavy cleaning of sewer pipe and removal of debris.
- C. "Heavy Cleaning Plan" describing the schedule of the work, equipment to be used, anticipated water pressure at point of cleaning, easement reels, auxiliary booster pumping equipment, root cutting equipment, material capture method, material transfer method from work area to trucks used for disposal, temporary bypass pumping, etc.
- D. The Contractor shall submit the name of the legal disposal area he has chosen to receive the materials removed from the cleaning of sewer pipe under this section.

## PART 2 PRODUCTS

## 2.01 CLEANING EQUIPMENT

- A. Hydraulically Propelled Equipment: The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned. If cleaning balls or other equipment, which cannot be

collapsed, are used, special precautions to prevent flooding of the sewers and public or private property shall be taken.

- B. High-Velocity Jet (Hydrocleaning) Equipment: All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees, in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring structure walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.
- C. Mechanically Powered Equipment: Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750 feet of rod. The rod shall be specifically heat-treated steel. To insure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.
- D. Root Cutting Equipment: Root cutters shall use the high-pressure water from a sewer jet truck and auxiliary equipment as required to create the necessary water pressure and speed to operate a hydraulic root cutter as recommended by the cutter manufacturer. The high-pressure water shall turn a hydraulic motor, which has a root cutting blade attached to the motor shaft. As with the cleaning nozzles, there shall be rear-facing jets on the root cutter assembly, which propels the cutter up and down the sewer pipe. The use of "chain cutters" is prohibited without prior approval of the Engineer.

## 2.02 WATER SUPPLY

- A. The Owner will supply a source of water for cleaning at some location within the Park, as selected by the Owner. The Contractor is responsible for transporting water from the source to the location necessary to complete his work. The Contractor shall take all care necessary to fill their water tanker slowly to prevent disturbance to settled material and deposits in the water main pipe. The Contractor shall use a hydrant wrench to open and close hydrants and not a pipe wrench.

## PART 3 EXECUTION

### 3.01 CLEANING PRECAUTIONS

- A. During pipe cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment.
- B. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the pipe line are used, precautions shall be taken to insure that the water head pressure created does not damage or cause flooding of public or private property being served by the sewer.
- C. When possible, the flow of water in the pipe shall be utilized to provide the necessary head pressure for hydraulic cleaning devices.
- D. No fire hydrant shall be used without permission from the Owner and, if permission is given, the hydrant shall not be obstructed in case of a fire in the area served by the hydrant.
- E. Gate valves, backflow preventers or an air gap shall be incorporated in the direct connection to a potable water source.

## 3.02 SEWER CLEANING

- A. The designated sewer manhole sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Selection of the equipment used shall be based on the conditions of lines at the time the work commences.
- B. The equipment shall be capable of removing dirt, grease, rocks, sand, branches, leaves, roots and other materials and obstructions from the sewer lines and structures.
- C. If cleaning of an entire section cannot be successfully performed from one structure, the equipment shall be set up on the other structure and cleaning again attempted.

## 3.03 MATERIAL REMOVAL

- A. Debris such as dirt, sand, rocks, grease, roots and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream structure of the section being cleaned.
- B. Passing material from sewer section to sewer section, which could cause line stoppages, accumulations of sand, etc. shall not be permitted.
- C. **The Engineer will televise segments of pipe downstream of the proposed segments of pipe designated for cleaning under this project just prior to and after the work of the Contractor. If it is determined that the Contractor has allowed significant solids to pass through the area of his work downstream into the sewer, the Contractor will be responsible to clean these pipe segments and dispose of materials at no additional cost to the Owner.**

## 3.04 DISPOSAL OF MATERIALS

- A. The Contractor shall arrange for a site and properly dispose of all materials removed from the sewer in accordance with all applicable laws and regulations.

## 3.05 ADJACENT PROPERTY

- A. Contractor shall notify adjacent property owners of the work prior to the start of pipe cleaning operations and advise property owners to close lids on toilets, cover sink drains, etc.
- B. Contractor shall promptly clean up areas within private property that get wet as a result of cleaning water back flushing up lateral pipes and resulting in a “blow out” inside a structure. Clean up shall include drying of wet areas with clean rags and the use of proper disinfectants to assure areas are left in a clean and sanitary condition.

## 3.06 FINAL ACCEPTANCE

- A. Acceptance of sewer line cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the Owner's Representative.
- B. If TV inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to re-clean and re-inspect the sewer line until the cleaning is shown to be satisfactory, at no additional cost to the Owner.

END OF SECTION 02650 – SEWER LINE CLEANING

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**SECTION 02651- TELEVISION INSPECTION**

## PART 1 GENERAL

## 1.01 SCOPE

- A. Provide all labor, materials, tools, equipment and incidentals specified, and required to perform a pre and post rehabilitation television (TV) inspection of the existing pipe including sewer mains and sewer lateral connections.
- B. Provide all labor, materials, tools, equipment and incidentals specified, and required to televise segments of pipe designated for rehabilitation.

## 1.02 DEFINITIONS

- A. Pre-Construction Inspection: TV inspection of main line sewers and lateral pipe to determine the location of construction, structural and O&M features, and to ascertain that the condition of pipe meets acceptable standards for the proposed rehabilitation.
- B. Warranty Inspection (Post Construction Inspection): TV inspection of sewer to be performed 18 to 24 months after completion of rehabilitation.

## 1.03 REQUIREMENTS

- A. The Contractor shall be aware that this Contract requires work in active sewers and shall follow all federal, state and local requirements for safety in confined spaces.

## 1.04 RELATED SECTIONS

- A. Temporary Bypass Pumping.
- B. Cleaning of Sewers.

## 1.05 PERFORMANCES REQUIREMENTS

- A. Inspection shall be performed by a NASSCO *Pipeline Assessment Certification Program* (PACP) certified operator and shall meet the coding and reporting standards and guidelines as set by PACP. These same standards shall also be used for lateral inspections regardless of whether conducted using cleanout launched or mainline launched lateral camera. All report annotations, pipe conditions and pipe defects shall be identified properly using PACP codes as defined by PACP, and severity ratings shall be calculated according to PACP.
- B. Quality of inspection recording shall be acceptable to Engineer when viewed on a standard computer monitor.

## 1.06 SUBMITTALS

- A. Submit work items for review in accordance with Section 01300.
- B. Pre-Construction Inspection: Submit 2 copies of the written inspection report and 2 copies, on data DVD, of Digital Inspection Recordings in mpeg format. Include written inspection reports in PDF format.
- C. When Sonding for cleanouts: Submit 2 copies, on data DVD, of Digital Surface Photographs of

proposed cleanout locations as specified below.

- D. Joint Testing and Grouting Observations: Submit 2 copies on DVD of observation of televised joint and lateral testing and retesting.
- E. Warranty Inspection: Same as Pre-Construction Inspection.
- F. Copies of PACP certificate for inspectors completing the work.

#### 1.07 REFERENCE STANDARDS

- A. NASSCO prepared *Pipeline Assessment and Certification Program*, Second Edition Reference Manual, 2001. This manual includes a standard TV inspection form and sewer condition codes.

#### PART 2 PRODUCTS

##### 2.01 TELEVISION EQUIPMENT

- A. Closed Circuit TV Equipment: Select and use closed-circuit television equipment that will produce a color recording.
- B. Pipe Inspection Camera: Produce video recording using a pan-and-tilt, radial viewing, pipe inspection camera that pans  $\pm 275$  degrees and rotates 360 degrees. Use a camera with an accurate footage counter that displays on the TV monitor the exact distance of the camera from the centerline of the starting manhole. Use a camera with camera height adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe being televised. Provide a lighting system that allows the features and condition of the pipe to be clearly seen. A reflector in front of the camera may be required to enhance lighting in large diameter pipe. Lighting shall not cause shadows within the field of view of the camera, either when forward viewing or when using pan/tilt. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution colored video picture. Picture quality and definition shall be to the satisfaction of the Engineer.
- C. Mainline Launched Lateral Inspection Camera: Produce a video recording using a fixed orientation color camera capable of extending into open lateral connects for a minimum distance of 80 feet from the lateral connection. Minimum performance standards are as noted above in 2.01.B.
- D. Lateral Cleanout Launched Lateral Inspection Camera: Alternatively, Contractor may produce a video recording of the sewer lateral between the sewer lateral cleanout and the mainline using a mini-cam launched from the sewer lateral cleanout. Minimum performance standards are as noted above in 2.01.B.
- E. When Sonding: Provide a sonde transmitter built into or attached to the head of lateral camera and a sonde receiver for surface location efforts. The sonde transmitter shall be capable of transmitting through 20 vertical feet of cover, such as the FV-20 from Prototek.
- F. TV Studio: TV studio is to be contained in an enclosed truck, trailer or van. It shall have room and seating for the operator and the ENGINEER and also room for at least one standing visitor with the doors closed. The studio shall have air conditioning and heating. Normal operation of all equipment, including the TV camera, monitor, and winches is to be from a control panel in the studio. When joint testing and sealing is to be performed, the equipment shall be contained in the same unit as its TV equipment and shall be operated from the same control panel.
- G. Recording: All recordings are to be in digital format.

1. Image Capture – Digitized picture images shall be stored and be exportable as JPEG formats. Minimum photo quality shall be resolution 1024 x 768 and 5 megapixels.
2. Video Capture – Full time live video and audio files shall be captured for each pipe segment and lateral inspected. The files shall be stored in industry standard MPEG format viewable from a DVD. The MPEG video shall be ISO-MPEG Level 1 (MPEG-1) coding with a resolution of 352 pixels (x) by 240 pixels (y) and an encoded frame rate of 29.97 frames per second. System shall perform an automatic disk image/file naming structure to allow saved video/data sections to be “Burned” to digital format. It shall have the capability of “burning” a minimum of 120 minutes of recording to digital media. The video recording shall be free of electrical interference and shall produce a clear and stable image. The audio recording shall be sufficiently free of background and electrical noise as to produce an oral report that is clear and discernible. The digital recordings and inspection data shall be cross-referenced to allow instant access to any point of interest within the digital recording.

### PART 3 EXECUTION

#### 3.01 TELEVISUAL INSPECTION

- A. Sewer main lines and lateral pipes are required to be clean in accordance with the Cleaning of Sewers section in this specification. Prior to the television inspection, any sewer main line or lateral pipe found to be dirty during the TV inspection process will be cleaned by the Contractor.
- B. Televiser the sewer lines to document the condition of the line. Notify the Engineer 48 hours in advance of any TV inspection so that the Engineer may observe inspection operations. Provide a color recording showing the completed work.
- C. For mainline inspections, inspections shall be from center of the starting manhole to the center of the ending manhole. Distances along the pipe should be measured from the center of the upstream manhole. Marking on cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement meters shall be accurate to two-tenths of a foot over the entire length of the sewer line section being inspected. Prior to recording the location of defects, construction features, and service connections, slack in the cable of the television inspection camera shall be taken up to ensure metering device is designating proper footage. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape, or other suitable device.
- D. For lateral inspections, insert a lateral inspection camera into the lateral line to observe and document the condition of the service connection line. Inspections shall be from center of the sewer main (or from the manhole wall for laterals connected directly to manholes) to the lateral cleanout if utilizing a mainline launched lateral inspection camera or vice versa when using a cleanout launched camera. Measurement meters shall be accurate to two-tenths of a foot over the entire length of the sewer lateral being inspected. Prior to recording the location of defects and construction features, slack in the cable of the television inspection camera shall be taken up to ensure metering device is designating proper footage. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape, or other suitable device. CONTRACTOR shall assign each lateral to a property by its respective address. Multiple laterals to the same property shall be addressed and numbered (i.e., “123 Main Street Lat1”). Should no address be apparent specify details to denote location (i.e., “vacant lot to south of 123 Main Street”). **To avoid delays in project completion, the Contractor shall complete lateral televising as soon as practical in the overall schedule and submit the results to the Engineer for review.**
- E. When sonding for cleanouts, provide digital photographs to denote the surface location of cleanouts. Photographs must meet the standard outlined in section 2.01 G above. CONTRACTOR is required to provide photographs renamed with the address of the lateral.

- F. Log any preset footage while recording to ensure the complete pipe is televised. Provide consistent recording of the inspection (i.e. the counter should not suddenly reset or jump during the recording). If a preset point on the CCTV cable is used to set the counter, CONTRACTOR shall back up the camera after setting the preset and record the entry to the pipe to the manhole.
- G. Center the camera in the middle of the pipe.
- H. Move the camera through the line (in the downstream direction whenever possible) at a uniform rate not to exceed 30 feet per minute.
- I. Stop at every joint for three seconds. When infiltration or other defects are evident, use pan and tilt to document pipe condition. Stop elsewhere when necessary to ensure proper documentation of the sewer's condition.
- J. Stop at every lateral connection. Center the camera so that the lighting and the pan and tilt view can be used to inspect as far into the lateral connection as possible. Recording all defects found in the service connection. Where lateral flow is observed, observe flows from service connections for approximately two minutes to ascertain if the flow is sanitary or extraneous flow. The video recording may be paused during observation. Record results of the flow observed on video recording and inspection logs.
- K. Insert a lateral inspection camera into the lateral line as far as possible to observe and document the condition of the service connection line.
- L. Capture color still shots of video recordings for all defects encountered.
- M. Use manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions to move the camera through the sewer line.
- N. TV inspection recordings shall be continuous for each pipe segment. Ensure entirety of each pipe is televised by beginning recording at center of start manhole, before proceeding to any pre-set footages.
- O. Contractor is responsible for adjusting light levels, cleaning fouled or fogged lens, and allowing vapor to dissipate from camera lights in order to produce acceptable recordings. All TV inspection recordings that do not meet the requirements of this Specification shall be re televised at no additional cost to the OWNER.

### 3.02 FLOW CONTROL

- A. Adequately control the flow in the section being televised so that the depth of flow is 5% or less in the pipe being televised.
- B. Whenever flows in a sewer line are blocked, plugged, pumped, or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might be inflicted by excess sewer surcharging.
- C. Contractor is responsible for all damages to Contractor owned and operated equipment, Owner facilities, and privately owned facilities caused by malfunction plugs, pumps or other Contractor owned or operated equipment.
- D. It is anticipated that portions of the sanitary sewer are bowed or bellied and as a result the camera will be submerged. **Wherever the camera encounters a submerged condition, or where the wastewater flow depth exceeds the maximum allowable, reduce the flow depth to an**

**acceptable level by performing the survey TV inspection during minimum flow hours, or by pulling a camera with swab, high-velocity jet nozzle or other acceptable dewatering device.** Recordings made while floating the camera are not acceptable unless approved by Engineer.

### 3.03 PASSAGE OF TV CAMERA

- A. If during TV inspection of a pipe segment the camera is unable to pass an obstruction even though flow is unobstructed, televise the pipe segment from the opposite direction in order to obtain a complete recording of the line. Contractor shall also measure the distance between the manholes (centerline to centerline) with a tape or wheel to accurately determine the total length of the manhole segment.

### 3.04 INSPECTION DELIVERABLES

#### A. Written Inspection Reports

1. Main line inspections shall provide printed location records to clearly identify the location of each defect, or lateral connection, in relation to adjacent manholes, using a standard stationing system zeroed on the upstream manhole. Record all information requested using proper NASSCO PACP defect codes. The reports shall include at least the minimum amount of information required by PACP, including required PACP header information. Color still shot images of all defects encountered shall be included with each pipe segment.
2. Lateral inspections shall meet the requirements detailed in 3.04 A1 above for each lateral pipe. In addition, provide a main line cover sheet detailing the main line manholes, length of main, orientation of flow, direction of survey and position of all lateral connections (by footage along the main and by assigned property address).

#### B. Electronic Inspection Reports

1. Provide a PACP- certified database listing all PACP required data fields for each pipe segment.
2. Provide all written inspection reports in PDF format.

#### C. Electronic Inspection Recordings

1. Provide digital inspection recordings for all recordings, unless otherwise specified in Paragraph 1.06.
2. Recording shall be of a quality sufficient for Engineer to evaluate the condition of the sewer main lines and lateral pipes, locate the sewer service connections, and verify cleaning and joint testing. If Engineer determines that the quality is not sufficient, Contractor shall re-televise the sewer segment and provide a new recording and report at no additional compensation. Camera distortions, inadequate lighting, high water level, dirty lens, or blurred/hazy picture will be cause for rejection. Payment for televised inspection will not be made until Engineer approves the recordings and reports.
3. Digital recordings: Each pipe segment, or lateral, must be its own electronic file in mpeg format. Each pipe segment file shall be named for pipe ID number, upstream manhole to downstream manhole (i.e. MH 2 to MH 3.mpeg). Lateral pipe files shall be named using their assigned property address (i.e. 234 Main Street, Lateral 2). Electronic recording file must allow snap scrolling to allow easy and quick access of the entire recording.

4. Contractor shall maintain a master copy of all recordings and Inspection Reports submitted for two years after delivery of reports and recordings.
5. Label each DVD with the following information:
  - a. File Number.
  - b. CONTRACTOR's Name.
  - c. Project Name.
  - d. Contract Number.
  - e. Inspection Type: Post Cleaning, Repair.
  - f. Tape Number.
  - g. Date Televised.
  - h. Pipe Segments.

END OF SECTION 02651 – TELEVISION INSPECTION

**SECTION 02656- REMOVAL OF PROTRUDING SERVICE CONNECTIONS**

## PART 1 GENERAL

## 1.01 SCOPE

- A. Furnish all equipment, labor, tools, materials, and incidentals necessary to internally remove service connections protruding into the sewer main.
- B. Ensure that the sewer is clean of all dirt and debris following removal of protruding service connections.
- C. Maintain wastewater flows, including bypass pumping, as required at all times during the performance of the Work.

## 1.02 GENERAL PRECAUTIONS

- A. Take precautions to protect sewer mains and manholes from damage that might be inflicted by the improper selection of the cleaning process or improper use of the equipment.
- B. When using hydraulically propelled devices, take precautions to ensure that the water pressure created does not cause damage or flooding to public or private property.
- C. Do not allow the sewer to fill with sewage above the crown of any sewer pipe, or beyond any elevation below the crown of the pipe that could cause overflow of sewage into area waterways, homes, or buildings, or onto the ground.
- D. The Contractor is advised that some of the manholes accessing sections of the sewer included in this work may be on private property and coordination / notification of property owners is required.

## PART 2 PRODUCTS

## 2.01 EQUIPMENT

- A. Remove the protruding service connection with an internal, remote-controlled intruding pipe remover. Excavation and replacement of the protruding service connection will not be allowed unless specifically indicated on the Drawings.
- B. The equipment shall be capable of cutting concrete, poly-vinyl chloride pipe, vitrified clay pipe or other materials commonly used for pipe construction with the exception of cast iron or steel.
- C. Pull the equipment through the sewer using winches and a cable set up between adjacent manholes.
- D. If necessary, position the equipment using a CCTV camera in conjunction with the cutter assembly.

## PART 3 EXECUTION

## 3.01 PERFORMANCE

- A. Remove the protruding service connection to the point where it is flush with the inside wall of the sewer main.
- B. Protect existing sewer lines and service connections from damage caused by improper use of the

equipment.

1. As directed by the Engineer, immediately repair damage to a sewer or service connection caused by removal of a protruding service connection, at no additional compensation.
- C. Remove all dirt and debris from the sewer following completion of protruding service connection removal in that reach.

END OF SECTION 02656 – REMOVAL OF PROTRUDING SERVICE CONNECTIONS

**SECTION 02700- CURED-IN-PLACE PIPE LINING**

## PART 1 GENERAL

## 1.01 GENERAL PROVISIONS

- A. Applicable provisions of the entire Project Manual including Addenda, shall govern this section as fully as if repeated herein.
- B. These Specifications include the minimum requirements for the rehabilitation of sanitary sewer pipelines by the installation of Cured-In-Place Pipe (CIPP) within the existing, deteriorated pipe as shown on the plans included as part of these contract documents.
- C. The rehabilitation of pipelines shall be done by the installation of a resin-impregnated flexible tube which, when cured, shall be continuous and tight-fitting throughout the entire length of the original pipe. The CIPP shall extend the full length of the original pipe and provide a structurally sound, jointless and water-tight new pipe within a pipe. The Contractor is responsible for proper, accurate and complete installation of the CIPP using the system selected by the Contractor.
- D. Neither the CIPP system, nor its installation, shall cause adverse effects to any of the Owner's processes or facilities. The use of the product shall not result in the formation or production of any detrimental compounds or by-products at the wastewater treatment plant. The Contractor shall notify the Owner and identify any by-products produced as a result of the installation operations, test and monitor the levels, and comply with any and all local waste discharge requirements.
- E. The Contractor shall cleanup, restore existing surface conditions and structures, and repair any of the CIPP system determined to be defective. The Contractor shall conduct installation operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, businesses, and property owners or tenants.
- F. The prices submitted by the Contractor, shall include all costs of permits, labor, equipment and materials for the various bid items necessary for the design, furnishing and installing, testing complete in place, CIPP in accordance with these specifications. All items of work not specifically mentioned herein which are required to make the product perform as intended and deliver the final product as specified herein shall be included in the respective lump sum and unit prices bid.

## 1.02 DESCRIPTION OF WORK

- A. These Specifications cover all work necessary to furnish and install the CIPP. The Contractor shall provide all materials, labor, equipment, and services necessary for submittals, CIPP design, notifications and coordination with the public, traffic control, bypass pumping and/or diversion of sewage flows, cleaning and television inspection of sewers to be lined, sealing active infiltration, pre liner if necessary, liner installation, reconnection of service connections, all quality controls, obtain samples for performance of required material tests, material testing, final television inspection, testing of lined pipe system and warranty work, all as specified herein.
- B. The product furnished shall be a complete CIPP system including all materials, applicable equipment and installation procedures. All CIPP systems will be required to meet the submittal requirements as contained herein.
- C. The CIPP shall be continuous and jointless from manhole to manhole or access point to access point and shall be free of all defects that will affect the long term life and operation of the pipe.
- D. The CIPP shall fit sufficiently tight within the existing pipe so as to not leak at the manholes, at the

service connections or through the wall of the installed pipe. If leakage occurs at the manholes or the service connections the Contractor shall seal these areas to stop all leakage using a material compatible with the CIPP as directed by the Owner at the price bid therefore in the Proposal. If leakage occurs through the wall of the pipe the liner shall be repaired or removed as recommended by the CIPP manufacturer. Final approval of the liner installation will be based on a leak tight pipe.

- E. The CIPP shall be designed for a life of 50 years or greater.
- F. The CIPP shall be designed as a fully structural stand-alone pipe-within-a-pipe. The installed CIPP shall be a structurally designed pipe within a pipe, meet or exceed all contract specified physical properties, fitting tightly within the existing pipe all within the tolerances specified. The installed CIPP shall withstand all applicable surcharge loads (soil overburden, live loads, etc.) and external hydrostatic (groundwater) pressure, if present, for each specific installation location.
- G. The installed CIPP shall have a long term (50 year) corrosion resistance to the typical chemicals found in domestic sewage.
- H. All existing and confirmed active service connections and any other service laterals to be reinstated as directed by the Owner shall be re-opened robotically or by hand in the case of man-entry size piping, to their original shape and to 95% of their original capacity. All reinstated service connections are to be "brushed" after being reopened. All over-cut service connections will be properly repaired to meet the requirements of these specifications.
- I. All materials furnished, as part of this contract shall be marked with detailed product information, stored in a manner specified by the manufacturer and tested to the requirement of this contract.
- J. Warranty inspections shall be executed by the Contractor. Any defects found shall be repaired or replaced by the Contractor.

### 1.03 REFERENCES

The following documents form a part of this specification to the extent stated herein and shall be the latest editions thereof. Where differences exist between codes and standards, the requirements of these specifications shall apply.

- A. ASTM -F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
- B. ASTM -F1743 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pull in and inflate and Curing of a Resin-Impregnated Tube
- C. ASTM -D543 Standard and Practice for Evaluating the Resistance of Plastics to Chemical Reagents
- D. ASTM -D638 Standard Test Method for Tensile Properties of Plastics
- E. ASTM -D790 Standard Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials
- F. ASTM -D792 Standard Test Methods for Density and Specific Gravity of Plastics by displacement
- G. ASTM -F2019-03 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
- H. ASTM -D2122-98(2004) Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

- I. ASTM -D2990 Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
- J. ASTM -D3567-97(2002) Standard Practice for Determining Dimensions of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
- K. ASTM -D3681 Standard Test Method for Chemical Resistance of “Fiberglass (Glass Fiber Reinforced Thermosetting Resin) Pipe in a Deflected Condition
- L. ASTM -D5813 Standard Specification for Cured-in Place Thermosetting Resin Sewer Pipe

#### 1.04 QUALIFICATIONS

- A. The Contractor shall have a minimum of three (3) years of continuous experience installing CIPP liners in pipe of a similar size, length and configuration as contained in this contract. A minimum of 150,000 linear feet of shop wet-out liner installation is required and minimum of 6 onsite wet-out installations are required as applicable to this contract.
- B. The lead personnel including the superintendent, the foreman and the lead crew personnel for the CCTV inspection, resin wet-out, the CIPP liner installation, liner curing and the robotic service reconnections must have a minimum of three (3) years each of total experience with the CIPP technology proposed for this contract and must have demonstrated competency and experience to perform the scope of work contained in this contract.
- C. The name and experience of each lead individual performing work on this contract shall be submitted to the Owner for review and approval.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Care shall be taken in shipping, handling and storage to avoid damaging the liner. Extra care shall be taken during cold weather construction. Any liner damaged in shipment shall be replaced as directed by the Owner at no additional cost to Owner.
- B. While stored, the CIPP shall be adequately supported and protected. CIPP shall be stored in a manner as recommended by the manufacturer and as approved by the Engineer.

#### 1.06 QUALITY CONTROL

- A. Quality Control shall be completed in accordance with Section 01400, Quality Control, of the Contract Documents.
- B. No change of material, design values, or procedures may be made during the course of the Work without the prior written approval of the Engineer.
- C. All liner to be installed under this Work may be inspected at the wet-out facility by the Owner. The Contractor shall require the wet-out facility's cooperation in these inspections. The cost of plant inspection will be the responsibility of the Owner.
- D. At the time of manufacture, each lot of liner shall be inspected for defects and tested in accordance with applicable ASTM standards. At the time of delivery, the liner shall be homogeneous throughout, uniform in color, free of cracks, holes, foreign materials, blisters, or deleterious faults.
- E. Contractor shall have a Quality Control Plan or Procedure in place that will allow the Engineer to monitor the resin impregnation process.

- F. All test results shall be provided by an independent, certified ISO 17025 testing facility.

#### 1.07 WARRANTY

- A. The materials used for the project shall be certified by the manufacturer for the specified purpose. The manufacturer shall warrant the liner to be free from defects in raw materials for three (3) years from the date of installation and acceptance by the Owner. The Contractor shall warrant the liner installation for a period of three (3) years. During the Contractor warranty period any defect, which may materially affect the integrity, strength, function and/or operation of the pipe, shall be repaired at the Contractor's expense in accordance with procedures included in this specification.
- B. After a pipe section has been lined and for a period of one (1) year following completion of the project, the Contractor will re-inspect all of the lined system in accordance with Sections 02650 and 02651. Post inspection videos are to be provided to the Owner for review. If it is found that any of the CIPP has developed abnormalities since installation the abnormalities shall be repaired and/or replaced as by the Contractor at no additional cost to the Owner.

#### 1.08 SUBMITTALS

- A. Performance Work Statement (PWS) Submittal - The Contractor shall submit, to the Owner, a Performance Work Statement (PWS) at the pre-construction meeting, which clearly defines the CIPP product delivery in conformance with the requirements of these contract documents. Unless otherwise directed by the Owner, the PWS shall at a minimum contain the following:
  - 1. Public information and notification procedure including sample notification letters to be used to inform and interact with the general public adjacent to the work and entities that will be affected by the work.
  - 2. Proposed "lay down" areas.
  - 3. A detailed installation plan describing all preparation work, cleaning operations, pre-CCTV inspections, by-pass pumping, traffic control, installation procedure, method of curing, service reconnection, quality control, testing to be performed, final CCTV inspection, warranties furnished and all else necessary and appropriate for a complete CIPP liner installation. A detailed installation schedule shall be prepared, submitted and conform to the requirements of this contract.
  - 4. Contractor's description of the proposed CIPP lining technology, including a detailed plan for identifying and recording the location of all active service connections, maintaining service during mainline installation to each home connected to the section of pipe being lined, including temporary service if required by the contract.
  - 5. All material submittals associated with the proposed CIPP process shall be included in this report.
  - 6. Engineering design calculations, in accordance with equations X1.1, X1.2, X1.3 and X1.4 of the Appendix of ASTM F-1216, for each length of liner to be installed including the thickness of each proposed CIPP. It will be acceptable for the Contractor to submit a design for the most severe line condition and apply that design to all of the line sections. These calculations shall be performed and certified by a qualified, Professional Engineer registered in the State of Delaware. All calculations shall include data that conforms to the requirements of these specifications.
  - 7. The PWS submittal shall include information on the cured-in-place pipe intended for installation and all tools and equipment required for a complete installation. The PWS shall identify which tools and equipment will be redundant on the job site in the event of equipment

breakdown. All equipment, to be furnished for the project, including proposed back-up equipment, shall be clearly described. The Contractor shall outline the mitigation procedure to be implemented in the event of key equipment failure during the installation process.

8. A detailed description of the Contractor's proposed procedures for removal of any existing blockages in the pipeline that may be encountered during the cleaning process.
9. The Contractor shall outline specific repair or replacement procedures for potential defects that may occur in the installed CIPP. Repair/replacement procedures shall be as recommended by the CIPP system manufacturer
10. Name and qualifications of independent testing laboratory provided by the Contractor.

#### B. Product Submittals

1. Fabric Tube – including the manufacturer and description of product components.
2. Flexible membrane (coating) material – including recommended repair (patching) procedure if applicable.
3. Raw Resin Data -including the manufacturer and description of product components.
4. Manufacturers' shipping, storage and handling recommendations for all components of the CIPP System.
5. All MSDS sheets for all materials to be furnished for the project.
6. Tube wet-out & cure method including:
  - A complete description of the proposed wet-out procedure for the proposed technology.
  - The Manufacturer's recommended cure method for each diameter and thickness of CIPP liner to be installed. The PWS shall contain a detailed curing procedure detailing the curing medium and the method of application.
  - Curing log of CIPP temperatures at the upstream and downstream manholes during the curing process to document that proper temperatures and cure times have been achieved. Curing logs must be submitted weekly.
7. Hydrophilic end seal material to be used and method of installation.
8. Available standard written warranty from the manufacturer of wet-out liner.

#### C. Miscellaneous Submittals

1. Documentation of Pre-Construction and Post-construction CCTV inspection of the pipe.
2. Copies of test results performed by Contractor's independent testing laboratory.
3. "As Built" Record Documents – "As Built" Record Documents shall be in accordance with Section 01720, Contract Closeout but at a minimum shall include As-Built drawings of the work, pre & post inspection DVD's of CCTV inspection of pipe. As-Built drawings will include the identification of the work completed by the Contractor and shall be prepared on one set of Contract Drawings provided to the Contractor at the onset of the project. As-Built drawings shall be kept on the project site at all times, and shall be clearly legible.
4. Safety – The Contractor is solely responsible for Safety at the site. The Contractor shall submit a proposed Safety Plan to the Owner, prior to beginning any work, identifying all competent

persons. The plan shall include a description of a daily safety program for the job site and all emergency procedures to be implemented in the event of a safety incident. All work shall be conducted in accordance with the Contractor's submitted Safety Plan.

## PART 2 PRODUCTS

### 2.01 GENERAL

- A. Acceptable curing methods include steam, hot water, and ultra-violet (UV).
- B. The CIPP System must meet the chemical resistance requirements of these contract documents.
- C. All materials, shipped to the project site, shall be accompanied by test reports certifying that the material conforms to the ASTM standards listed herein.
- D. Materials shall be shipped, stored, and handled in a manner consistent with written recommendations of the CIPP system manufacturer to avoid damage. Damage includes, but is not limited to, gouging, abrasion, flattening, cutting, puncturing, or ultra-violet (UV) degradation. On site storage locations, shall be approved by the Owner. All damaged materials shall be promptly removed from the project site at the Contractor's expense and disposed of in accordance with all current applicable agency regulations.
- E. A pre-liner is required to be installed to prevent active infiltration into the sewer main during installation of the CIPP system should grouting not be successful in stopping active infiltration.

### 2.02 FABRIC TUBE

- A. The fabric tube shall consist of one or more layers of absorbent non-woven felt fabric, felt/fiberglass or fiberglass and meet the requirements of ASTM F 1216, ASTM F 1743, ASTM D 5813 & ASTM F2019. The fabric tube shall be capable of absorbing and carrying resins, constructed to withstand installation pressures and curing temperatures and have sufficient strength to bridge missing pipe segments, and stretch to fit irregular pipe sections. The contractor shall submit certified information from the felt manufacturer on the nominal void volume in the felt fabric that will be filled with resin.
- B. The wet-out fabric tube shall have a uniform thickness and excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.
- C. The fabric tube shall be manufactured to a size and length that when installed will tightly fit the internal circumference, meeting applicable ASTM standards or better, of the original pipe. Allowance shall be made for circumferential stretching during installation. The tube shall be properly sized to the diameter of the existing pipe and the length to be rehabilitated and be able to stretch to fit irregular pipe sections and negotiate bends. The Contractor shall determine the minimum tube length necessary to effectively span the designated run between manholes. The Contractor shall verify the lengths in the field prior to ordering and prior to impregnation of the tube with resin, to ensure that the tube will have sufficient length to extend the entire length of the run. The Contractor shall also measure the inside diameter of the existing pipelines in the field prior to ordering liner so that the liner can be installed in a tight-fitted condition.
- D. The outside and/or inside layer of the fabric tube (before inversion/pull-in, as applicable) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate, if applicable, vacuum impregnation and monitoring of the resin saturation during the resin impregnation (wetout) procedure.
- E. No material shall be included in the fabric tube that may cause de-lamination in the cured CIPP. No dry or unsaturated layers shall be acceptable upon visual inspection as evident by color contrast between the felt fabric and the activated resin containing a colorant.

- F. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made. The hue of the color shall be dark enough to distinguish a contrast between the fully resin saturated felt fabric and dry or resin lean areas.
- G. Seams in the fabric tube, if applicable, shall meet the requirements of ASTM D5813.
- H. The outside of the fabric tube shall be marked every 5 feet with the name of the manufacturer or CIPP system, manufacturing lot and production footage.
- I. The minimum length of the fabric tube shall be that deemed necessary by the installer to effectively span the distance from the starting manhole to the terminating manhole or access point, plus that amount required to run-in and run-out for the installation process.
- J. The nominal fabric tube wall thickness shall be constructed, as a minimum, to the nearest 0.5 mm increment, rounded up from the design thickness for that section of installed CIPP. Wall thickness transitions, in 0.5 mm increments or greater as appropriate, may be fabricated into the fabric tube between installation entrance and exit access points. The quantity of resin used in the impregnation shall be sufficient to fill all of the felt voids or the nominal felt thickness.

#### 2.03 RESIN

- A. The resin shall be a corrosion resistant polyester or vinyl ester resin and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216, ASTM F1743 or F2019, the physical properties herein, and those, which are to be utilized in the design of the CIPP for this project. The resin shall produce CIPP which will comply with or exceed the structural and chemical resistance requirements of this specification.

#### 2.04 STRUCTURAL REQUIREMENTS

- A. The physical properties and characteristics of the finished liner will vary considerably, depending on the types and mixing proportions of the materials used, and the degree of cure executed. It shall be the responsibility of the Contractor to control these variables and to provide a CIPP system which meets or exceeds the minimum properties specified herein.
- B. The CIPP shall be designed as per ASTM standards. The CIPP design shall assume a fully deteriorated host pipe and no bonding to the original pipe wall.
- C. The Contractor's design engineer shall set the long term (50 year extrapolated) Creep Retention Factor at 33% of the initial design flexural modulus as determined by ASTM D-790 test method. This value shall be used unless the Contractor submits long term test data (ASTM D2990) to substantiate a higher retention factor.
- D. The cured pipe material (CIPP) shall, at a minimum, meet or exceed the structural properties, as listed below.

#### 2.05 MINIMUM PHYSICAL PROPERTIES

- A. Property Test Method Cured Composite Per ASTM F1216
  - 1. Cured Composite Per Design
  - 2. Flexural Modulus of Elasticity (Short Term) ASTM D-790 250,000 psi Contractor Value
  - 3. Flexural Strength (Short Term) ASTM D-790 4,500 psi Contractor Value

- B. Wall Thickness - The required structural CIPP wall thickness shall be based, as a minimum, on the physical properties of the cured composite and per the design of the Professional Engineer and in accordance with the Design Equations contained in the appendix of the ASTM standards, and the following design parameters:
1. Design Safety Factor 2.0 (1.5 for pipes 36" or larger)
  2. Creep Retention Factor 33%
  3. Ovality 2% or as measured by field inspection
  4. Constrained Soil Modulus Per AASHTO LRFD Section 12 and AWWA Manual M45
  5. Groundwater depth same as depth of soil over pipe
  6. Soil Depth (above the crown) As specified or indicated on the Plans
  7. Live Load Highway, railroad or airport as applicable
  8. Soil Load (assumed) 120 lb/cu. Ft.
  9. Minimum service life 50 years
- C. The Contractor shall submit, prior to installation of the lining materials, certification of compliance with these specifications and/or the requirements of the pre-approved CIPP system. Certified material test results shall be included that confirm that all materials conform to these specification and/or the pre-approved system. Materials not complying with these requirements will be rejected.
- D. The design soil modulus may be adjusted based on data determined from project soil testing results, if available.

### PART 3 EXECUTION

#### 3.01 CONSTRUCTION REQUIREMENTS

- A. Preparation, cleaning, inspection, sewage by-passing and public notification. The Contractor shall clean and televise the interior of the existing host pipe prior to installation of the CIPP liner. All debris and obstructions, that will affect the installation and the final CIPP product delivery to the Owner, shall be removed and disposed of.
- B. The CIPP liner shall be constructed of materials and methods, that when installed, shall provide a jointless and continuous structurally sound liner able to withstand all imposed static and dynamic loads on a long-term basis.
- C. The Contractor may, under the direction of the Owner, utilize any of the existing manholes in the project area as installation access points. If a street must be closed to traffic because of the location of the sewer, the Contractor shall request a Road Closure and furnish a detailed traffic control plan and all labor and equipment necessary. Approval of the plan is at the discretion of the local agency having jurisdiction over traffic control. The traffic control plan shall be in conformance with the requirements of the local agency having jurisdiction over traffic control.
- D. Cleaning of Pipe Lines – The sewer segments to be lined shall be cleaned in accordance with the Contract Documents. The Contractor shall remove all internal debris from the pipe line that will interfere with the installation and the final product delivery of the CIPP as required in these specifications. Solid debris and deposits shall be removed from the system and

disposed of properly by the Contractor. Moving material from manhole section to manhole section shall not be allowed. As applicable the contractor shall either plug or install a flow bypass pumping system to properly clean the pipe lines. Precaution shall be taken, by the Contractor in the use of cleaning equipment to avoid damage to the existing pipe. The repair of any damage, caused by the cleaning equipment, shall be the responsibility of the Contractor. The Contractor is responsible to designate a site for the disposal of all debris removed, from the Owner's sewer system, as a direct result of the cleaning operation. Unless otherwise specified by the Owner, the Contractor shall dispose of all debris at no charge.

- E. By-passing Existing Sewage Flows – Bypass Pumping shall meet the requirements of the Contract Documents. The Contractor shall provide for the flow of existing mainline and service connection effluent around the section or sections of pipe designated for CIPP installation. Service connection effluent may be plugged only after proper notification to the affected residence and may not remain plugged overnight. Installation of the liner shall not begin until the Contractor has installed a sewage by-pass system and all pumping facilities have been installed and tested under full operating conditions including the bypass of mainline and side sewer flows. Once the lining process has begun, existing sewage flows shall be maintained, until the resin/felt tube composite is fully cured, cooled down, full televised and the CIPP ends finished. The Contractor shall coordinate sewer bypass and flow interruptions with the Owner at least 14 days in advance and with the property owners and businesses at least 5 business days in advance. The pump and bypass lines shall be of adequate capacity and size to handle peak flows. The Contractor shall submit a detail of the bypass plan and design to the Owner before proceeding with any CIPP installation.
- F. CCTV Inspection of Sewers to be Lined - Contractor shall perform pre and post lining video inspections of the pipelines. Only PACP certified personnel trained in locating breaks, obstacles and service connections by closed circuit television shall perform the inspection. The Contractor shall provide the Owner a copy of the pre-cleaning and post-cleaning video and logs in digital format for review prior to installation of the CIPP and for later reference by the Owner.
- G. Line Obstructions -It shall be the responsibility of the Contractor to clear the line of obstructions that will interfere with the installation and long-term performance of the CIPP. If pre-installation inspection reveals an obstruction, misalignment, broken or collapsed section or sag that was not identified as part of the original scope of work and will prohibit proper installation of the CIPP, the Contractor shall notify the Engineer and Owner of the unforeseen condition.
- H. The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing and curing the CIPP. **Each connection will be dye tested or televised with a mainline launched lateral inspection camera to determine whether or not the connection is live or abandoned.**
- I. The Owner will supply a source of water at some location within the Park, as selected by the Owner. The Contractor is responsible for transporting water from the source to the location necessary to complete his work. The Contractor shall take all care necessary to fill their water tanker slowly to prevent disturbance to settled material and deposits in the water main pipe. The Contractor shall use a hydrant wrench to open and close hydrants and not a pipe wrench.

### 3.02 INSTALLATION OF LINER

- A. The CIPP Liner shall be installed and cured in the host pipe per the manufacturer's specifications as described and submitted in the PWS.
- B. CIPP installation shall be in accordance with the applicable ASTM standards.
- C. The wet-out tube shall be positioned in the pipeline using the method specified by the manufacturer. Care should be exercised not to damage the tube as a result of installation. The

tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.

- D. Prior to installation and as recommended by the manufacturer remote temperature gauges or sensors shall be placed inside the host pipe to monitor the temperatures during the cure cycle. Liner and/or host pipe interface temperature shall be monitored and logged during curing of the liner.
- E. Curing shall be accomplished by utilizing the appropriate medium in accordance with the manufacturer's recommended cure schedule. The curing source or in and output temperatures shall be monitored and logged during the cure cycles. The manufacturer's recommended cure schedule shall be used for each line segment installed, and the liner wall thickness and the existing ground conditions with regard to temperature, moisture level, and thermal conductivity of soil, per ASTM as applicable, shall be taken into account by the Contractor.

### 3.03 COOL DOWN

- A. The Contractor shall cool the CIPP in accordance with the approved CIPP manufacturer's recommendations as described and outlined in the PWS.
- B. Temperatures and curing data shall be monitored and recorded, by the Contractor, throughout the installation process to ensure that each phase of the process is achieved as approved in accordance with the CIPP System manufacturer's recommendations.

### 3.04 FINISH

- A. The installed CIPP shall be continuous over the entire length of a sewer line section and be free from visual defects such as foreign inclusions, dry spots, pinholes, major wrinkles and delamination. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to inside the lined pipe.
- B. Any defect, which will or could affect the structural integrity or strength of the linings, shall be repaired at the Contractor's expense.
- C. The beginning and end of the CIPP shall be sealed to the existing host pipe with a hydrophilic end seal. The sealing material shall be compatible with the pipe end and shall provide a watertight seal.
- D. If any of the service connections leak water between the host pipe and the installed liner, the connection mainline interface shall be sealed to provide a water tight connection.
- E. If the wall of the CIPP leaks, it shall be repaired or removed and replaced with a watertight pipe as recommended by the manufacture of the CIPP system.

### 3.05 MANHOLE CONNECTIONS AND RECONNECTIONS OF EXISTING SERVICES

- A. A hydrophilic seal, similar to Compound CRS-656 as manufactured by LMK Technologies, shall be applied at manhole walls in accordance with the CIPP System manufacturer's recommendations.
- B. Existing services shall be internally or externally reconnected unless indicated otherwise or determined to be inactive as a result of the dye testing or televising of the lateral pipe as discussed in Section 3.01 H of this specification.
- C. Reconections of existing services shall be made after the CIPP has been installed, fully cured, and cooled down. It is the Contractor's responsibility to make sure that all active service

connections are reconnected and inactive service connections are not reconnected.

- D. External reconnections are to be made with a tee fitting in accordance with CIPP System manufacturer's recommendations. Saddle connections shall be seated and sealed to the new CIPP using grout or resin compatible with the CIPP.
- E. A CCTV camera and remote cutting tool shall be used for internal reconnections. The machined opening shall be at least 95 percent of the service connection opening and the bottom of both openings must match. The opening shall not be more than 100 percent of the service connection opening. The edges of the opening shall not have pipe fragments or liner fragments, which may obstruct flow or snag debris and shall be brushed.
- F. In the event that service reinstatements result in openings that are greater than 100 percent of the service connection opening, the Contractor shall install a CIPP type repair, sufficiently in size to completely cover the over-cut service connection. The repair type must be approved by the Owner and there will be no additional compensation for the repair of over-cut service connections.
- G. Coupons of pipe material resulting from service tap cutting shall be collected at the next manhole downstream of the pipe rehabilitation operation prior to leaving the site. Coupons may not be allowed to pass through the system.

### 3.06 TESTING OF INSTALLED CIPP

- A. The Contractor shall take a restrained sample for each segment of CIPP installed. Contractor shall submit each sample to an independent testing laboratory for testing for flexural modulus of elasticity, flexural strength and thickness in accordance with D-790. Results are to be submitted directly to Engineer within 30 days from the date of installation.
- B. Physical properties from the testing agency must meet or exceed those provided on the design calculations.
- C. The Contractor shall provide samples for testing to the Owner.
- D. Chemical resistance -The CIPP system installed shall meet the chemical resistance requirements of ASTM standards. CIPP samples tested shall be of fabric tube and the specific resin proposed for actual construction. It is required that CIPP samples without plastic coating meet these chemical testing requirements.
- E. Hydraulic Capacity -Overall, the hydraulic capacity shall be maintained as large as possible. The installed CIPP shall at a minimum be equal to the full flow capacity of the original pipe before rehabilitation. In those cases where full capacity cannot be achieved after liner installation, the Contractor shall submit a request to waive this requirement, together with the reasons for the waiver request. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.

### 3.07 FINAL ACCEPTANCE

- A. All CIPP sample testing and repairs to the installed CIPP as applicable, shall be completed, before final acceptance, meeting the requirements of these specifications and documented in written form.
- B. The Contractor shall perform a detailed closed-circuit television inspection in accordance with the Specifications and ASTM standards, in the presence of the Owner after installation of the CIPP liner and reconnection of the side sewers. A radial view (pan and tilt) TV camera shall be used. The camera shall be panned 360 degrees around the circumference of the pipe and along the wall of the finished pipe at 10 foot intervals. The finished liner shall be continuous over the entire

length of the installation and shall be free of significant visual defects, damage, deflection, holes, leaks and other defects. Unedited digital documentation of the inspection shall be provided to the Owner within ten (10) working days of the liner installation. The data shall note the inspection date, location of all reconnected side sewers, debris, as well as any other defects in the liner, including, but not limited to, gouges, cracks, bumps, or bulges. If post installation inspection documentation is not submitted within Ten (10) working days of the liner installation, the Owner may at its discretion suspend any further installation of CIPP until the post-installation documentation is submitted. As a result of this suspension, no additional working days will be added to the contract, nor will any adjustment be made for increase in cost. Immediately prior to conducting the closed circuit television inspection, the Contractor shall thoroughly clean the newly installed liner removing all debris and buildup that may have accumulated.

- C. Bypass pumping or plugging from the upstream manhole shall be utilized to minimize sewage from entering the line during the inspection. In the case of bellies in the line, the pipe shall be cleared of any standing water to provide continuous visibility during the inspection.
- D. Where leakage is observed through the wall of the pipe, the contractor shall institute additional testing including but not limited to air testing, localized testing and any other testing that will verify the leak-proof integrity of the installed CIPP to the satisfaction of the Owner.

### 3.08 ADDITIONAL SITE SPECIFIC INFORMATION

See Tables in Bid Package.

END OF SECTION 02700 – CURED-IN-PLACE PIPE LINING

**SECTION 02750- CURED-IN-PLACE LATERAL LINING**

## PART 1 GENERAL

## 1.01 INTENT

- A. This specification covers requirements and test methods for the lining of sewer service lateral pipe without excavation. The lateral pipe shall be remotely accessed from the main pipe and/or from a cleanout.
- B. The lateral lining shall be accomplished by the installation of a resin impregnated one-piece lateral lining by means of air inflation and inversion. The liner is pressed against the host pipe by pressurizing a bladder that is held in place until the thermo-set resins have cured.
- C. When cured, the liner shall extend over a predetermined length of the service lateral as a continuous, one piece, tight fitting, corrosion resistant and non-leaking cured in-place pipe.
- D. The lateral lining will provide a non-leaking connection at the interface of the mainline and lateral pipelines.
- E. The Contractor shall provide all materials, equipment, labor and incidentals for the installation and testing of cured-in-place lateral lining system as described above including the pressure grouting of active infiltration prior to the insertion of the liner, if required.
- F. The Contractor is required to sonde each lateral immediately after award of the contract to determine the location, length and depth of each lateral pipe as well as mark in the field a proposed clean out location.

## 1.02 GENERAL

- A. The reconstruction shall be accomplished using a non-woven textile tube of particular length and a resin with physical and chemical properties appropriate for the application. The lateral tube is vacuum impregnated with the synthetic resin and is then placed inside of a protective carrying device. The mainline portion of the liner is physically attached to the lateral portion. The protective launching device is winched into the existing sewer. When the launching device is properly positioned at the lateral connection, the mainline bladder is inflated by pressurized air that presses the main liner against the host pipe. The lateral portion is then, inverted up through the lateral service line by the action of the inversion bladder. Once the resin-saturated liner is cured, the inversion bladder and launching/carrying devices are removed.

## 1.03 RELATED SECTIONS

- A. Section 02150, Sewage Bypass Pumping.
- B. Section 02222, Excavation
- C. Section 02223, Backfilling
- D. Section 02650, Sewer Line Cleaning
- E. Section 02651, Television Inspection.

## 1.04 REFERENCE STANDARDS

Comply with applicable provisions and recommendations of the most recent edition of following:

- A. ASTM C581 – Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service.
- B. ASTM D543 – Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
- C. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.
- D. ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- E. ASTM D2990 – Standard Test methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.
- F. ASTM D5813 – Standard Specification for Cured-In-Place Thermosetting Resin Sewer Pipe.
- G. ASTM F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
- H. ASTM F1743 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).
- I. Standards of American National Standards Institute, ANSI.
- J. NASSCO Guidelines – Recommended Specifications for Sewer Collection System Rehabilitation.

## 1.05 QUALIFICATIONS

- A. A qualified bidder for installing a lateral repair system shall use a Manufactured System that has a minimum of a five-year history of satisfactory performance and the Manufactured System shall have performed a minimum of 5,000 successful in the U.S.
- B. Bidders shall be prepared to submit a list of installation projects, numbers of connections sealed and lateral footage lined providing contact names, addresses, and telephone numbers for reference.
- C. The Cured in Place Lateral Lining Contractor shall be licensed and certified by the manufacturer of the Manufactured System and have successfully completed at least 2,000 lateral rehabilitations.
- D. Each installation crew must be directly supervised by a dedicated foreman having previously supervised the successful installation of at least 500 lateral rehabilitations using the Manufactured System.

## 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Care shall be taken in shipping, handling and storage to avoid damaging the liner. Extra care shall be taken during cold weather construction. Any liner damaged in shipment shall be replaced as directed by the Owner.
- B. While stored, the material associated with the Manufactured System shall be adequately supported and protected and stored in a manner as recommended by the manufacturer.

## 1.07 QUALITY CONTROL

- A. Though the process may be licensed, no change of material, design values, or procedures may be made after bidding and during the course of the Work without the prior written approval of the Engineer.
- B. At the time of manufacture, each lot of liner shall be inspected for defects and tested in accordance with applicable ASTM standards. At the time of delivery, the liner shall be homogeneous throughout, uniform in color, free of cracks, holes, foreign materials, blisters, or deleterious faults.
- C. For testing purposes, a production lot shall consist of all liner having the same marking number. It shall include any and all items produced during any given work shift and must be so identified as opposed to previous or ensuing production.
- D. The Contractor shall have a Quality Control Plan or Procedure in place that will allow the Engineer to monitor the resin impregnation process.

## 1.08 WARRANTY

- A. All lining work shall be fully guaranteed by the Contractor and by the manufacturer for a period of 5 years from the date of Final Acceptance. During this period, all defects in liner material, inadequate structural strength, or any shortcoming in workmanship discovered by the Owner or Engineer shall be removed and replaced in a satisfactory manner at no cost to the Owner. In addition to the Warranty Inspection specified below, the Owner may conduct an independent television inspection, at its own expense, of the lining work at any time prior to the completion of the guarantee period.

## 1.09 SUBMITTALS

- A. Submittals shall conform to the requirements of Section 01300, Submittals.
- B. Bidders shall be prepared to submit a list of installation projects, numbers of connections sealed and lateral footage lined providing contact names, addresses, and telephone numbers for reference.
- C. For Cured-In-Place Lateral Lining System - Submit the following:
  - 1. Structural design calculations and specification data sheets listing all parameters used in the liner design and thickness calculations based on Appendix XI of ASTM F1216 for each pipe segment/lateral. All calculations shall be prepared under and stamped by a Professional Engineer registered in the State of Delaware.
  - 2. The name of the liner and resin manufacturer, the location of the facility where each was manufactured and a list of appurtenant materials and accessories to be furnished.
  - 3. Manufacturer's Quality Control Plan or procedures that ensure proper materials are used in the resin impregnation process and in liner shipping and storage.
  - 4. Certified test reports from an independent testing agency that the liner and resin for this Work was manufactured and tested in accordance with the ASTM Standards specified herein and complies with all specified ASTM Standards.
  - 5. Form of Manufacturer's Warranty

## D. For Resin submit the following Product Data:

1. Technical data sheet showing physical and chemical properties.
2. Test results from an independent testing agency to show compliance with all specified ASTM standards.

## E. For Flexible Tube submit the following Product Data:

1. Technical data sheet showing physical properties.
2. Test results from an independent testing agency to show compliance with all specified ASTM Standards.

## F. Sample Testing

1. *Sampling* - The preparation of a CIPP sample is required at the rate of one sample per 5 laterals installed. The owner will randomly select which lateral installations are to be sampled. The sample shall be prepared by securing a flat plate mold using the textile tube material and resin system as used for the rehabilitated pipe.
2. *Length* - The minimum length of the sample must be able to produce at least five specimens for testing in accordance with ASTM D-790-03.
3. *Short-Term Flexural (Bending) Properties* – The initial tangent flexural modulus of elasticity and flexural stress shall be measured for gravity and pressure pipe applications in accordance with Test Method D 790.
4. *CIPP Wall Thickness* – The minimum wall thickness at any point shall not be less than 87.5% of the specified design thickness as approved by Engineer.

## G. Contractor's Installation Procedures

1. Prior to start of work of this Section submit the following for Engineer's approval:
  - a. Installation and quality control plan, including bypass pumping plans, mainline sewer and lateral cleaning plan and cleanliness requirements, liner shot plan and sequence, liner installation standard procedures, and plan to manage flow to/from laterals during lining.
  - b. Proposal curing schedule for each shot, including heating, curing, and cool-down schedules.
  - c. Contingency Plan, including methods and equipment to be used to repair unacceptable liner defects and for removing failed liners.

## H. Installation Reports

1. Submit to Engineer reports documenting the following portions of the work.
  - a. Copies of curing log sheets or written verification that the resin system has cured in accordance with manufacturer's recommendations for each inversion
  - b. Copies of test results.

- c. Documentation of Physical Condition Inspection and Post-Construction Inspection.
- d. Warranty

PART 2 PRODUCTS

2.01 QUALIFIED MANUFACTURERS

- A. The following manufacturers/suppliers of cured-in-place pipe lateral lining systems are approved for use on this project.
  - 1. T-Liner as manufactured by LMK Enterprises, Inc.
  - 2. Service Connect Seal + Lateral as manufactured by BLD Services, LLC.

2.02 LINER MATERIAL

- A. The liner assembly shall be continuous in length and consist of one or more layers of absorbent textile material i.e. needle punched felt, circular knit or circular braid that meet the requirements of ASTM F1216 and ASTM D5813 Sections 6 and 8. The textile tube and sheet shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe segments, and flexibility to fit irregular pipe sections. The wet-out textile tube and sheet shall meet ASTM F 1216, 7.2 as applicable, and shall have a uniform thickness and 5% to 10% excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.
- B. The main sheet and lateral tube shall be a one-piece assembly formed in the shape of a “T” or WYE. No intermediate or encapsulated elastomeric layers shall be in the textile that may cause de-lamination in the cured in place pipe. The lateral tube will be continuous in length and the wall thickness shall be uniform. The lateral tube will be capable of conforming to offset joints, bells, and disfigured pipe sections.

2.03 RESIN SYSTEM

- A. The resin shall produce CIPP, which will comply with the structural and chemical resistance requirements of ASTM F1216.

2.04 CURED IN PLACE LATERAL LINER STRUCTURAL PROPERTIES

A. Property	ASTM Test	Minimum Value	
		psi	(MPa)
Flexural Strength	D 790	4,500	(31)
Flexural Modulus	D 790	250,000	(1,724)

2.05 CURED IN PLACE LATERAL LINER WALL THICKNESS

- A. The CIPLL shall be designed per ASTM F1216, Appendix XI for a fully deteriorated pipe.
- B. The CIPLL design for the lateral tube shall assume no bonding to the original pipe.
- C. A minimum overall safety factor of 2.0.
- D. A minimum service life of 50 years under continuous service.

- E. A modulus of soil reaction of 950 psi.
- F. A soil density of 120 lbs/ft<sup>3</sup>.
- G. A Poisson's ratio of 0.3.
- H. An enhancement factor of 7.
- I. A groundwater elevation over the pipe equivalent to surface grade.
- J. An ovality of 2% unless pre-installation inspection reveals conditions that warrant higher values.
- K. HS-20 loading.
- L. A soil depth equal to the depth of the upstream or downstream manhole on that pipe segment, whichever is deeper.
- M. The flexural modulus and flexural strength used in the design shall be the values as rated for the design life. Independent third party test data of field samples are required as substantiation of the values used in design.
- N. The liner thickness of each pipe segment shall be determined by the Contractor and submitted per Paragraph 1.09 of this Section.
- O. Installed thickness of the Cured in Place Lateral Liner shall be within minus 5 percent and plus 15 percent of the design thickness as certified by an independent testing laboratory which will take the sample and retain custody of the material.

### PART 3 EXECUTION

#### 3.01 LATERAL LOCATIONS

- A. The Contractor is required to sonde each lateral immediately after award of the contract to determine the location, length and depth of each lateral pipe as well as mark in the field a proposed clean out location.
- B. The Contractor is to provide Engineer with post cleaning videos of all laterals to allow selection of clean outs to be installed. Contractor is to assume 10 days of time will be required for Engineer to select clean out location after all post cleaning videos have been provided.

#### 3.02 PREPARATION

- A. *Access Safety* – Prior to entering access areas such as manholes, an excavation pit, performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen shall be undertaken in accordance with local, state, or federal safety regulations. All confined space entry shall be conducted in accordance to OSHA regulations.
- B. *Cleaning and Inspection* – As per NASSCO Standards and Section 02650 and 02651 of these specifications.
- C. *Accessing the Lateral* – The lateral will be accessed from the sewer main unless a clean out is provided.
- D. *Plugging & Pumping* – The contractor is responsible for ensuring the lateral is dry during insertion

and curing of the liner assembly ensuring no flows enter the pipe. Coordination with the homeowner may be required. When required, the main pipe flows will be by-passed in accordance with these specifications. The pumping system shall be sized for normal to peak flow conditions. The upstream manhole shall be monitored at all times and an emergency deflating system will be incorporated so that the plugs may be removed at any time without requiring confined space entry. Maintain commercial and residential sewer service of active laterals during the installation process and bypass pump individual laterals if needed.

- E. *Inspection of Pipelines* – The interior of the main line and lateral pipeline shall be carefully inspected to determine the location of any condition that shall prevent proper installation, such as roots, and collapsed or crushed pipe sections. These conditions shall be noted. Experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television shall perform inspection of pipelines.
- F. *Line Obstructions* – The existing service lateral shall be clear of obstructions that prevent the proper insertion and expansion of the lining system. Changes in pipe size shall be accommodated, if the lateral tube is sized according to the pipe diameter and condition. Obstructions may include dropped or offset joints of no more than 20% of inside pipe diameter.
- G. *Resin Impregnation* – The felt liner shall be vacuum-impregnated with resin (wet-out) under controlled conditions. The volume of resin used shall be sufficient to fill all voids in the textile lining material at nominal thickness and diameter. The volume shall be adjusted by adding 5% to 10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe. No dry or unsaturated area in the mainline sheet or lateral tube shall be acceptable upon visual inspection.
- H. *Sequence* - Lateral lining shall only occur after the corresponding mainline sewer has been lined, tested, and approved by the Engineer. If the corresponding mainline sewer is not going to be lined, lateral lining shall proceed in accordance with the approved schedule of work. Ensure the proper sequence of work between the mainline and lateral lining activities.
- I. *Measurements* - Inspect and confirm the inside diameter, alignment, length, and condition of each lateral to be lined.
- J. Use the data and information collected from this inspection to verify the size of the liner and refine the installation techniques. If unknown physical conditions in the work area that differ materially from those ordinarily encountered are uncovered during the investigation, the Contractor shall notify the Engineer.
- K. Submit Pre-Construction Inspection submittal of laterals proposed to be lined to Engineer as soon as practical prior to commencement of lining work.
- L. *Notifications* - Provide notifications in accordance with requirements of Project Coordination Specification 01040.
- M. *Pressure Grouting* – Pressure grouting may be required to stop active infiltration prior to the insertion of the cured in place lateral liner.
- N. *Protruding Lateral Connections to the Main* – Contractor may be required to grind back the protrusions to the point where the performance of the liner will not be affected.

### 3.03 INSTALLATION

- A. *Liner Insertion* – The lateral tube and inversion bladder will be inserted into the carrying device. A hydrophilic sealant is applied to the main/lateral interface and shall be applied as a maximum of two-inch (2") wide band on the main liner. Additional hydrophilic sealant shall be applied 3 inches

prior to the end of the tube and at 5 feet intervals along the length of the lateral liner tube for tubes in excess of 5 feet in length. Both the launching and carrying device are pulled into the pipe using a cable winch. The lateral tube is completely protected during the pull. The liner assembly shall not be contaminated or diluted by exposure to dirt, debris, or water during the pull.

- B. *Bladder* – The main bladder shall be inflated causing the main sheet to press tightly against the main pipe. The lateral tube is inverted by the action of the lateral bladder through the center of the main liner as it extends up into the lateral pipe to a termination point. The Main/Lateral bladder assembly shall extend past all ends of the liner, as no cutting shall be required.
- C. *Curing* – After liner placement is complete; pressure is maintained pressing the liner firmly against the inner pipe wall. The liner is chemically cured at ambient temperatures or by a suitable heat source. The heating equipment shall be capable of delivering a mixture of steam and air throughout the liner bladder assembly to uniformly raise the temperature above the temperature required to cure the resin. The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of the soil). The heat source temperatures shall be monitored and logged during the cure and cool down cycles. The manufacturer's recommended cure schedule shall be submitted.
- D. *CIPP Processing* – Curing shall be done without pressure interruption with air or a mixture of air and steam for the proper duration of time per the resin manufacturer's recommendations. When the heat source is removed and the temperature on both ends of the CIPP reaches 100 degrees Fahrenheit or less, the processing shall be finished.

#### 3.04 FINISH

- A. *The finished CIPP* – Shall be continuous over the entire length of the sewer service lateral designated for. The CIPP shall be smooth with minimal wrinkling and increase flow rate. The CIPP shall be free of dry spots, lifts, and delaminated portions. The CIPP shall taper at each end providing a smooth transition for accommodating video equipment and maintaining proper flow in the mainline. The finished product must provide an airtight/ watertight non-leaking connection between the main sewer and sewer service lateral.
- B. *Post Installation Televising* – After the work is completed, the installer will provide the owner with post installation television footage documenting the repair. Each lateral will be identified by the lateral address. Television inspection shall be conducted with lateral launch equipment from the sewer main and also via push camera from the cleanout, should a cleanout be available. All defects discovered during the Post-Construction Inspection shall be corrected by the Contractor before the Work will be considered for Acceptance. After the defects are corrected, the Contractor shall re inspect and re-submit the lateral.

#### 3.05 FINAL CLEANUP

- A. Upon completion of rehabilitation work and testing, clean and restore project area affected by the Work.

#### 3.06 CURED IN PLACE LATERAL LINER TESTING

- A. All sampling shall be conducted in the presence of the Engineer.
- B. *Sampling* –The preparation of a CIPP sample is required. The sample shall be prepared by securing a flat plate mold using the textile tube material and resin system as used for the rehabilitated pipe.
- C. *Length* – The minimum length of the sample must be able to produce at least five specimens for

testing in accordance with ASTM D-790-03.

- D. *Short-Term Flexural (Bending) Properties* – The initial tangent flexural modulus of elasticity and flexural stress shall be measured for gravity and pressure pipe applications in accordance with Test Method D 790.
- E. *CIPP Wall Thickness* – The minimum wall thickness at any point shall not be less than 87.5% of the specified design thickness as agreed upon between purchaser and seller.
- F. Samples, collected at a frequency of one sample per five installed laterals, shall be sent to an independent testing agency. Results shall be provided to the Owner and Engineer within 30 days from date of installation.

### 3.07 WARRANTY INSPECTION

- A. Provide a CCTV inspection in accordance with Sections 02650 and 02651 12 months after completion of CIPP Lateral Liners work showing all completed work. Conduct all inspections in the presence of the Engineer.
- B. All defects discovered during the television inspection shall be corrected by the Contractor at no additional compensation. After the defects are corrected, the lateral shall be inspected again at no additional compensation.

### 3.08 ADDITIONAL SITE SPECIFIC INFORMATION

Included in Contract Documents.

END OF SECTION 02750 – CURED-IN-PLACE LATERAL LINING

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**SECTION 02764 - SANITARY SEWER PACKER INJECTION GROUTING**

## PART 1 GENERAL

## 1.01 SCOPE

- A. The work in this Section consists of the grouting of joints to stop active infiltration immediately prior to the installation of a CIPP system.

## 1.02 SAFETY

- A. Contractor shall be solely responsible for safety during the performance of all Work. Contractor shall take satisfactory precautions to protect the sewer segments and appurtenances from damage that might be inflicted upon them by the use of grouting equipment. Any damage inflicted upon a sewer segment or other public or private property as a result of the Contractor's grouting operations, regardless of the grouting method used and regardless of any other circumstance which may contribute to the damage, shall be repaired by Contractor at his sole expense. Contractor shall not enter into any sewer segment where hazardous conditions may exist until such time as the source of those conditions is identified and eliminated by the Contractor. Contractor shall perform all work in accordance with the latest OSHA confined space entry regulations. Contractor shall coordinate his work with local fire, police and emergency rescue units.

## 1.03 MINIMUM QUALIFICATIONS

- A. Contractor shall have a history of at least five years of pressure testing and grouting sewer pipe joints lateral connections.
- B. The chemical sealant shall have documented service of successful performance in similar usage, with a minimum of 12,000 joints grouted.
- C. All work shall be supervised by a foreman having previously performed pressure testing and chemical grout sealing of a minimum of 250 lateral tap connections and sewer pipe joints.

## 1.04 GUARANTEE

- A. All sanitary sewer joints and lateral connections grouted prior to the installation of the CIPP system shall be free from active leaks.

## 1.05 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01340.
- B. Chemical Grout
- C. Equipment: Pressure grouting equipment and procedures.

- D. Records: Contractor shall record and submit field records for each sewer section prior to, during, and after completion of the chemical grouting operation. Records shall include information such as accurate locations, gel times, grout volumes, grout pressures, air temperatures, and joints not sealed due to close proximity to building service connections and manholes.

## PART 2 PRODUCTS

### 2.01 MATERIALS

#### A. Delivery, Storage and Handling:

1. Contractor shall deliver materials to job site in undamaged, unopened containers bearing manufacturer's original labels.
2. Materials used as chemical grout shall be transported, stored, and placed in manner prescribed by manufacturer of those materials, as detailed in published data provided by manufacturer.
3. Handling, formulation and storage of the grout compound shall be in strict conformance with the manufacturer's recommendations. The uncured grout shall be delivered to the site in unopened containers, with the date of manufacturer clearly indicated, no uncured grout manufactured more than six months prior to the date of application shall be utilized. Any uncured grout compound determined to be more than six month old shall be immediately removed from the site. Once a container of uncured grout has been opened it shall be used within 24 hours.

#### B. Chemical Grout

1. Grout used shall be Avanti AV-100 acrylamide or equal. Contractor shall provide a chemical sealant solution containing principal chemical sealant constituent, initiator (trigger) and catalyst specifically recommended for the purpose of sealing leaks in sanitary sewer lines and manholes. Chemical sealant constituent, initiator (trigger) and catalyst shall be compatible when mixed.
2. Solution shall have ability to tolerate dilution and react in moving water. After final reaction, it shall be a stiff, impermeable, yet flexible gel.
3. The grout proportions shall be such that dilute aqueous solutions – when properly catalyzed – will form stiff gels.
4. Grout shall make true solution at concentrations as high as three pounds per gallon of water.
5. Solutions shall have ability to accept dilution by groundwater of at least 50% by volume, without significantly changing sealing ability of the gel when at rest or in motion.
6. Solutions shall gel in a predetermined time when exposed to normal groundwater pH ranges, and be capable of formula adjustments to compensate for changing conditions.

7. Final reaction shall produce a continuous, irreversible, impermeable stiff gel at chemical concentrations as low as 0.4 lbs per gallon of water that is able to break away from the joint sealing packer when the packer is deflated.
8. Gel shall not be rigid or brittle. Gel shall have negligible corrosion rate on mild steel plates.

C. Water shall be potable.

## 2.02 EQUIPMENT

- A. Contractor shall provide equipment consisting of closed-circuit television systems, necessary chemical sealant containers/tanks, pumps, regulators, valves, hoses, etc. and joint sealing packers for appropriate sizes of pipe designated to receive chemical grouting.
- B. The packer shall be cylindrical and have a diameter less than the pipe size. The packer shall be constructed in a manner to allow restricted amounts of sewage to flow and shall be pneumatically operated. Hydraulically or mechanically expanded devices shall not be permitted.
- C. Tap and lateral service sealing shall be accomplished with a lateral packer. The objective of the lateral service packer is to seal the tap connection to the main sewer and a portion of the lateral service. The lateral sealing inversion tube shall be designed to accommodate 4-inch and 6-inch diameter laterals and laterals with a transition diameter. Lateral service sealing shall grout a minimum of the connection and the second joint or use a 6 foot long sleeve, whichever is less, for laterals directly connected to the mainline sewer.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. **Cleaning:** Prior to the application of chemical grouting materials, Contractor shall thoroughly clean the sewer designated to receive the chemical grouting in accordance with Section 02650 of the Contract Documents. Cleaning shall constitute removal of all debris, solids, roots and other deposits in the sewer line; particularly at the sewer pipe joints. Acceptance of cleaning work in sewer line sections shall not be made until testing and sealing of joints and cracks in section of the respective sewer have been completed.
- B. **Inspection of Pipelines:** After cleaning and prior to application of chemical grouting materials, Contractor shall inspect the sewer designated to receive the chemical grouting. Sewer line inspection requirements are contained in Section 0265, Television Inspection of the Contract Documents. If inspection reveals an obstruction or condition that will not allow for the passage of grouting equipment or does not lend itself to grouting, such as a badly dropped joint or badly misaligned joints, Contractor shall notify Engineer of condition.
- C. **Sewage Flow Control:** Contractor shall provide for maintenance of flow in the affected portions of the sewer system during grouting of the sewer line.

Requirements for sewage flow control and bypass pumping are contained in Section 02150, Bypass Pumping of the Contract Documents. Sewage flow control shall be employed by Contractor when sewer line depth of flow at the upstream manhole of the sewer line section being worked is above the maximum allowable. Flow control shall be accomplished by bypass pumping of flow from upstream of the sewer segment to be grouted to a point downstream of the sewer segment to be grouted.

1. Maximum Depth of Flow for Joint Testing/Sealing, 8 in. – 24 in. diameter pipe  
25% of pipe diameter
- D. Pre Sealing Pressure Testing: Not Required on this project. Only active leaks are to be sealed and then pressure tested.
- E. Chemical Grout Application
1. Repairs shall take place at joints, generally small circumferential cracks, small holes, or similar points of infiltration as identified. The repair shall be such that the original cross-sectional area and shape of the interior of sewer pipe shall not be permanently reduced or changed.
  2. Sewer Pipe Joints
    - a. Contractor shall position the sealing packer over the area of infiltration by means of a metering device at the surface and closed circuit television camera in the line.
    - b. Accurate measurement of the location of the defect to be sealed shall be made, using the portion of sealing packer as "Datum" or measurement point or target.
    - c. Such measurement to the target shall also be used to obtain necessary measurement for positioning the injection area of sealing packer over area to be sealed.
    - d. Contractor shall expand the sealing packer sleeves using controlled pressures.
    - e. Expanded sleeve shall seal against the inside periphery of pipe to form a void area at the point of infiltration, completely isolated from the remainder of the line.
    - f. Contractor shall pump sealant materials into this isolated area through hose systems at controlled pressures which are in excess of groundwater pressures.
    - g. Contractor shall pump as much grout as is field-required to seal any leaks and fill the voids.
    - f. Grout shall break away from the packer and stay in place when the packer is deflated and moved from the point of infiltration.
    - h. Upon completion of injection, Contractor shall retest the point of repair. If retesting shows the seal was not completely effective, Contractor shall repeat the sealing process until the defect successfully passes the pressure test.
    - i. After sealing the entire sewer section, Contractor shall remove surplus grouting material from section at the immediate downstream manhole. If surplus grouting materials left in the sewer section by Contractor results in sewer surcharging and subsequent damage to public or

- private property, Contractor shall be responsible for damage to property and expenses incurred by Owner.
- k. For mainline sewer pipe joint sealing and sealing laterals connected to manholes by packer injection grouting, gel times shall be 30 seconds  $\pm$  seconds unless otherwise approved by Engineer.

### 3. Lateral Connections

- a. The lateral packer shall remain in position during the sealing of the connection, thus maintaining the isolated void. Grout will be pressure injected through the lateral packer into the annular space between the inversion tube and the lateral pipe. Under pressure, the grout shall be then force out into the soil through leaking joints and pipe defects.
- b. Upon completion of the lateral sealing procedure, the lateral shall be air tested to confirm the sealing of the connection. If the lateral fails the air test, the grouting procedure shall be repeated at no additional cost to the Owner. This sequence of grouting and subsequent air testing shall be repeated until either the lateral is sealed or it is determined that the grout consumption is too high and may result in the blockage of the lateral pipe. The Final Determination To Stop Subsequent Attempts To Seal A Lateral Will Be Made Jointly Between The ENGINEER And The CONTRACTOR.
- c. The CONTRACTOR shall confirm lateral flow after the successful sealing of each lateral tap. With the lateral packer in position, the inversion tube shall be retracted and air pressure injected into the lateral. Should a pressure build in the lateral and not drop to approximately zero in a few seconds, the packer will be moved off the connection and the connection shall be viewed with a television camera. With the camera viewing the connection point, an attempt will be made to obtain a water flush by the occupant. If no water is viewed during this procedure, it will be assumed that the building sewer connection is blocked with grout and the responsibility to clear the lateral will be the Contractor's at no additional cost to the OWNER. Blockages in the lateral that are not the result of grouting operations shall not be the responsibility of the CONTRACTOR.

### 3.02 DISPOSAL

- A. Furnish a container for collection of cleaning solvents used in the cleaning of the grouting equipment. An approved solvent recovery process shall dispose of collected solvents. Disposal of cleaning solvents into the sewer system or into natural watercourses will be strictly prohibited.

END OF SECTION 02764 – SANITARY SEWER PACKER INJECTION GROUTING

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**SECTION 02775 - CURED-IN-PLACE PIPE SECTIONAL LINING****PART 1 GENERAL****1.01 DESCRIPTION**

- A. The Contractor shall provide all materials, equipment, labor and incidentals for the installation and testing of cured-in-place pipe section liner within the sewer main between manhole runs.
- B. The sectional cured in place pipe lining process shall consist of inserting a resin-impregnated flexible tube which is inflated in a short length of the pipeline to form a hard, impermeable, corrosion resistant pipe within a pipe. When cured, the cured-in-place-pipe will be formed to the original conduit. The impermeable Cured-In-Place-Pipe (CIPP) should be continuous, tight-fitting, chemical resistant and air tight.
- C. The sectional cured in place pipe liner shall provide hydraulic flow equal to or greater than the existing sewer.

**1.02 REFERENCE STANDARDS**

- A. Comply with applicable provisions and recommendations of the following:
  - ASTM D638 – Standard Test method for Tensile Properties of Plastics.
  - ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  - ASTM F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

**1.03 QUALIFICATIONS**

- A. For each method of installation and curing used on this project the Contractor shall have a demonstrated history of at least 50 cured in place pipe sectional liners in sewers of similar size and using a similar resin and felt and using the specific method of installation and curing being used.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Care shall be taken in shipping, handling and storage to avoid damaging the liner.
- B. All material shall be shipped, stored and handled in conformance to the material manufacturer's requirements and recommendations.

**1.05 WARRANTY**

- A. All lining work shall be fully guaranteed by the Contractor for a period of 5 years from the date of Final Completion.

**1.06 SUBMITTALS**

- A. Qualifications of Contractor and Foremen who will complete the lining process.

- B. Flexible Tube
- C. Resin
- D. Installation Procedure
- E. Sectional liner design assuming a fully deteriorated pipe section.
- F. Hydrophilic end seal material to be used and method of installation.
- G. Documentation of Pre-Construction and Post-construction CCTV Inspection of the pipe.
- H. Warranty

## PART 2 MATERIAL

- 2.01 The tube will consist of one or more layers of flexible needled felt or an equivalent non-woven material. The tube will be continuous in length exhibiting a uniform minimum wall thickness based upon design calculations. The tube will be capable of conforming to offset joints, bells, and disfigured pipe sections. The liner shall be fabricated to a size that when reformed will tightly fit the sewer being rehabilitated. The length of the liner shall be that deemed necessary by the Contractor to effectively carry out installation and seal the liner at each end of the point repair. The finished point repair should be continuous over the length of the defect plus one foot. Allowance for longitudinal and circumferential expansion shall be taken into account when sizing and installing the liner. The flex tube shall contain no intermediate or encapsulated elastomeric layers. No materials shall be included in the tube that are subject to delaminating when cured. All dimensions shall be field verified by the Contractor prior to delivery of the liner.
- 2.02 The resin will be polyester or vinyl ester with proper catalysts as designed for the specific application. The cured-in-place pipe shall provide a smooth bore interior. Each installation shall have a design report documenting the design criteria for a fully deteriorated pipe section, relative to the hydrostatic pressures, depth of soil cover, and type of soil.

The composite of the materials above will, upon installation inside the host pipe, exceed the minimum test standards specified by the American Society for Testing Methods.

### Test Standards for CIPP

FLEXURAL STRENGTH (ASTM D-790)	4,500 PSI
FLEXURAL MODULUS (ASTM D-790)	250,000 PSI
TENSILE STRENGTH (ASTM D-638)	3,000 PSI

- 2.03 The CIPP Sectional Liner design shall assume a fully deteriorated host pipe condition, groundwater over pipe to existing surface grade, a service life of 50 years and H<sub>2</sub>O loading above the pipe. The point repair shall be designed as per ASTM F1216 and shall assume no bonding to the host pipe wall. The liner thickness of each pipe segment shall be determined by the Contractor and submitted per Paragraph 1.06 of this Section.

## PART 3 – EXECUTION

### 3.01 PREPARATION

- A. Inspect and confirm the inside diameter, alignment and condition of each segment to be lined. Use the data and information collected from this inspection to verify the size of the liner and refine the installation techniques.
- B. Clean and televise sewer lines immediately prior to the installation of the cured in place sectional liner. All roots, debris, and protruding service connections will be removed prior to lining. The sewer lines shall be free of any condition that will adversely affect the installation of the liner.
- C. As required, provide for continuous sewage flow around the section of sewer that is to be lined in conformance with the requirements of these Contract Documents.
- D. Grout pipe segments found to have actively leaking defects per the requirements of the Contract Documents.
- E. Remove pockets of water from the pipe in areas to be lined.

### 3.02 INSTALLATION

- A. Coordinate with adjacent property owners and Engineer prior to installation of the liner per the Notifications section of the Contract Documents.
- B. The tube shall be impregnated with the resin as recommended by the Sectional Liner Manufacturer.
- C. The tube shall be properly oriented and loaded onto the Carrier Train for proper installation over the repair area.
- D. The Carrier Train shall be pulled or winched to the damaged area and positioned by Closed Circuit TV camera guiding the installation.
- E. The installation shall follow the Manufacturers Process for inflation, curing and stripping out.
- F. The finished ends of the liner shall be neat and form a tight seal to the original host pipe. The finished ends of the liner shall provide a smooth transition from the host pipe to segment of pipe being lined and shall not be “curled” or in a condition that could cause the collection of debris.

### 3.03 POST-CONSTRUCTION INSPECTION OF COMPLETED WORK

- A. Provide Post-construction Inspection video documentation showing completed work in accordance with the Contract Documents. All defects discovered during the television inspection shall be corrected by the Contractor without additional compensation and the Post-construction Inspection for that sectional liner shall be repeated.
- B. The Post-construction Inspection video shall be submitted to the Engineer.

### 3.04 FINAL CLEANUP

- A. Upon completion of rehabilitation work and testing, clean and restore project area affected by the Work.

### 3.05 TESTING

- A. Hydraulic Capacity – Calculations must support that the finished Cured-In-Place-Pipe (CIPP) shall have at least 100% of the full flow capacity of the original host pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the original pipe material. A typical roughness coefficient for the CIPP shall be as verified by third part test data.

### 3.06 WARRANTY INSPECTION

- A. Provide a CCTV inspection 18 to 24 months after completion of the Cured in Place Sectional Liner work showing all completed work in accordance with the Contract Documents. The actual period for inspection shall be determined by the Engineer and will ideally be conducted during high groundwater conditions.
- B. Correct all defects discovered during the warranty period at no additional compensation. After all the defects are corrected, inspect the sewer again at no additional compensation to the Owner.

END OF SECTION – 02775 CURED-IN-PLACE PIPE SECTIONAL LINING

**SECTION 02937- SITE RESTORATION**

## PART 1 GENERAL

## 1.01 WORK INCLUDED

- A. All damaged or disturbed areas shall be restored in accordance with this section and to the condition prior to construction or better.
- B. Preparation of subsoil.
- C. Placing topsoil.
- D. Fertilizing.
- E. Seeding.
- F. Mulching.

## 1.02 DEFINITIONS

- A. Noxious Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwork, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

## 1.03 REGULATORY REQUIREMENTS

- A. Conform to requirements of the Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.
- B. Comply with regulatory agencies for fertilizer. Herbicides shall not be utilized on this Project.
- C. Comply with requirements of the Delaware Sediment and Stormwater Management program.

## 1.04 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, percent germination, year of production, net weight, date of packaging, and location of packaging.

## 1.05 SCHEDULING AND COORDINATION

- A. Coordinate Work of this Section with Work of other Sections.
- B. Schedule site restoration operations to minimize the time disturbed areas will be left exposed to erosion.

## 1.06 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on all seed mixes with certified statement of weight, composition, mixture, percentage of purity, and germination as verification that the proper materials and volumes have been used. Also provide data on all soil amendment materials, herbicides, or other chemicals to be used for

work of this Section.

#### 1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and protect Products to site under provisions of Section 01600.
- B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- C. Deliver fertilizer in original, unopened waterproof bags showing weight, chemical analysis, name of the manufacturer.

### PART 2 PRODUCTS

#### 2.01 SEED MIXTURE

- A. Permanent grass seed mixture shall be Seeding Mix No. 3.
- B. The date of the last germination of the seed shall be within a period of six months prior to commencement of planting operations. Seed shall be from same of previous year's crop; each variety of seed shall have a purity of not less than 85%, a percentage of germination not less than 90%, shall have a weed content of not more than 1% and contain no noxious weeds.

#### 2.02 TOPSOIL

- A. Excavated material from site and free of roots, rocks, subsoil, debris, and weeds.
- B. If there are not sufficient quantities of topsoil at the site to complete the restoration of disturbed areas per the requirements of this specification, the Contractor shall provide the additional topsoil required from an approved source.

#### 2.03 MULCHING AND BINDER

- A. Dry oat or wheat straw, free from weeds and foreign matter detrimental to plant life. Hay is not acceptable.
- B. Synthetic binder for mulch shall be non-asphaltic emulsion, Mulch Mate Super Tack or approved equal.

#### 2.04 SOIL SUPPLEMENTS

- A. Add limestone and fertilizer in accordance with the Delaware Erosion and Sediment Control Handbook (current version).

#### 2.05 WATER

- A. Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

### PART 3 EXECUTION

#### 3.01 INSPECTION

- A. Verify that subgrade is ready to receive the work of this Section.

#### 3.02 PREPARATION OF SUBSOIL

- A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

- B. Remove foreign materials, weeds, and undesirable plants and their roots. Remove contaminated subsoil.
- C. Prepare subgrade to obtain satisfactory bond between subsoil and topsoil by scarifying subsoil to a depth of 3 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil. This operation shall not be performed when subgrade is frozen, excessively wet or dry. Scarify immediately prior to topsoil placement.

### 3.03 PLACING TOPSOIL

- A. Spread topsoil to a minimum depth of 4 inches over area to be seeded. Rake until smooth.
- B. Place topsoil during dry weather and on dry, unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material while spreading.
- D. Grade to eliminate rough, low, or soft areas, and to ensure positive drainage.

### 3.04 SOIL SUPPLEMENTS

- A. Apply limestone and fertilizer according to manufacturer's instructions, Delaware Erosion and Sediment Control Handbook (current version), and the E&S Drawings.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply lime or fertilizer at same time or with same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid the dissipation of fertilizer.
- F. Any irregularities or depressions caused by liming or fertilizing operations shall be corrected prior to seeding.

### 3.05 SEEDING

- A. Apply seed in accordance with the Delaware Erosion and Sediment Control Handbook (current version) and the E&S Drawings.
- B. If using mechanical spreading apply evenly in two intersecting directions. Rake in lightly.
- C. Do not seed area in excess of that which can be mulched on same day.
- D. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- E. Roll seeded area with roller not exceeding 112 lbs.

### 3.06 MULCHING

- A. Immediately following seeding and compaction apply mulch in accordance with the Delaware Erosion and Sediment Control Handbook (current version) and the E&S Drawings.
- B. Apply mulch binder at a rate recommended by manufacturer immediately after placement of mulch.

- C. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

3.07 MAINTENANCE

- A. Areas shall be mowed not less than once each 10 days to help prevent weeds from establishing.
- B. General restored areas shall be cut to a height no less than 2 1/2”.
- C. Neatly trim edges and hand clip where necessary.
- D. Control growth of weeds.
- E. Reseed any areas which do not show even stand.
- F. Contractor shall water restored areas until Final Completion.

3.08 GUARANTEE PERIOD

- A. All restored areas shall be guaranteed by the Contractor for not less than one full year from the date of Final Completion.
- B. During first planting season after Final Completion, any restored areas not demonstrating satisfactory stands, as determined by the Engineer, shall be renovated, reseeded, and maintained by Contractor until satisfactory stands are attained at all restored areas.
- C. A satisfactory stand shall be defined as an even stand of grass, after cutting, at least 2 1/2” tall with at least 85% germination.

3.09 PROTECTION

- A. Protect restored area from damage until area is stabilized. Repair damaged areas at no additional cost to the Owner.

END OF SECTION 02937 – SITE RESTORATION

**SECTION 03300- CAST IN PLACE CONCRETE**

## PART I GENERAL

## 1.01 WORK INCLUDES

- A. Cast in place concrete structures.
- B. Work of this section includes, but is not necessarily limited to, the following:
  - 1. Sidewalk, Curb & Gutter.
  - 2. Concrete Road Base
  - 3. Structural concrete.
  - 4. Concrete appurtenances such as equipment pads and entrance pads.
  - 5. Footings and slabs on grade.
  - 6. Concrete reinforcement and accessories.
  - 7. Vapor barrier under slabs on grade.
  - 8. Hardener/Sealer application.

## 1.02 CODES AND STANDARDS

- A. Except as modified by the requirements specified herein and/or the details on the Drawings, all Work included in this Section shall conform to the applicable provisions of the following codes and standards:
  - 1. ACI 211.1 - Recommended Practice for Selecting Proportions for Normal and Heavy Weight Concrete
  - 2. ASTM C260 - Air Entraining Admixture for Concrete
  - 3. ACI 301 - Specifications for Structural Concrete for Buildings. The Contractor shall have one copy of ACI 301 available for reference on the work site at all times.
  - 4. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement
  - 5. ANSI/ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement
  - 6. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement
  - 7. ASTM C33 - Concrete Aggregates
  - 8. ASTM C150 - Portland Cement
  - 9. ASTM C330 - Lightweight Aggregate for Structural Concrete
  - 10. ASTM C994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type)
  - 11. ACI-304 - Recommended Practice for Measuring, Mixing, and Placing Concrete

12. ACI-305 - Recommended Practice for Hot Weather Concreting
13. ACI-306 - Recommended Practice for Cold Weather Concreting
14. ACI-311 - Manual of Concrete Inspection
15. ACI-315 - Manual of Standard Practice for Detailing Reinforced Concrete
16. ACI-318 - Building Code Requirements for Reinforced Concrete
17. ASTM C94 - Ready Mixed Concrete
18. ASTM Standards C143, C31, C173, C231, C172 and C39
19. ACI-350 - Concrete Sanitary Engineering Structures
20. ASTM D2103 - Polyethylene Film and Sheeting
21. Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.

B. Definitions:

1. ACI - American Concrete Institute,  
P. O. Box 19150, Detroit, Michigan 43219
2. ASTM - American Society for Testing Materials
3. CRSI - Concrete Reinforcing Steel Institute, "Manual of Standard Practice"  
228 N. LaSalle Street, Chicago, IL 60601

1.03 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the codes, specifications and standards listed in 1.02 (above), except where more stringent requirements are shown or specified.
- B. Concrete Testing Service: Contractor shall engage a testing laboratory approved by Engineer, to perform material evaluation tests and to design concrete mixes under provisions of Section 01400. Quality Control Testing requirements are described in Part 3 of this Specification.

1.04 SUBMITTALS

A. Product Data:

1. Proposed design mix.
2. Submit data for materials indicated herein:
  - a. Admixtures: Provide manufacturer's written certification that chloride ions content complies with specified requirements.
  - b. Submit data for materials and accessories, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, waterstop, curing compounds, dry-shake finish materials, expansion bolts, adhesive anchors, vapor barrier and grout.

- B. Shop Drawings: Reinforcement: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, diagrams of bent bars, and arrangement of concrete reinforcement.
- C. Laboratory Test Reports: Submit laboratory test reports as specified to Engineer.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Forms:
  - 1. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow of deflection.
  - 2. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
  - 3. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
- B. Reinforcing Materials:
  - 1. Reinforcing Bars: ASTM A615, Grade 60, deformed.
  - 2. Welded Wire Fabric: ASTM A185, welded steel wire fabric.
    - a. The type of mesh shall be approved by the Engineer.
  - 3. Supports for Reinforcement: Provide supports for reinforcement including boosters, chairs, spacers and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable.
    - a. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
- C. Concrete Materials:
  - 1. General: Calcium chloride or admixtures containing more than 0.1% chloride ions are not permitted.
  - 2. Portland Cement: ASTM C150, Type I, unless otherwise acceptable to Engineer. Use one (1) brand of cement throughout project.
  - 3. Normal Weight Aggregates: ASTM C33, and as herein specified. Provide aggregates from a single source for exposed concrete.

- a. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
  4. Water: Drinkable
  5. Air-Entraining Admixture: ASTM C260.
    - a. Products: Subject to compliance with requirements, provide one of the following:  
"Sike Aer"; Sika Corp.  
"MB-VR or MB-AE"; Master Builders  
"Dorex AEA"; W.R. Grace  
"Edoco 2001 or 2002"; Edoco Technical Products
  6. Water-Reducing Admixture: ASTM C 494, Type A and contain not more than 0.1% chloride ions.
    - a. Subject to compliance with requirements, provide one of the following:  
"Eucon WR-75"; Euclid Chemical Co.  
"Pozzolith 344"; Master Builders  
"Plastocrete 160"; Sika Chemical Corp.  
"Chemtard"; Chem-Masters Corp.
- D. Related Materials:
1. Chemical Hardener: Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 lbs. of fluosilicates per gal.
    - a. Products: Subject to compliance with requirements, provide one of the following:  
"Surfhard"; Euclid Chemical Co.  
"Lapidolith"; Sonneborn-Contech  
"Saniseal 100"; Master Builders  
"Burk-O-Lith"; The Burke Co.  
"Hornolith"; A.C. Horn
  2. Moisture-Retaining Cover: One of the following, complying with ASTM C171  
  
Waterproof paper  
Polyethylene film  
Polyethylene-coated burlap
- 2.02 PROPORTIONING AND DESIGN OF MIXES
- A. Design Mixes:
1. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use an independent testing facility acceptable to Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Engineer.
  2. Submit written reports to Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by

Engineer.

3. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
    - a. Class A Concrete, 2000 psi compressive strength at 6 hours, 4500 psi compressive strength at 28 days, in accordance with the Delaware Department of Transportation (DelDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.
  4. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at not additional cost to Owner and as accepted by Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer before using in work.
- B. Admixtures:
1. Use water-reducing admixture in concrete as required for placement and workability.
  2. Use air-entraining admixture in exterior exposed concrete and all floor slabs, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content within the limits of 2% to 4% air.
  3. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
- C. Mix Proportioning:
1. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (WC) ratios as follows:
    - a. Subjected to freezing and thawing; WC 0.50.
    - b. Subjected to deicers/watertight; WC 0.45.
  2. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
    - a. Slabs: Not more than 3".
    - b. Reinforced foundation systems: Not less than 1" and not more than 4".
    - c. Other concrete: Not more than 4".

## 2.03 CONCRETE MIXES

- A. Ready-Mix Concrete: Comply with requirements of ASTM C94, and as herein specified.
1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required.
  2. When air temperature is between 85°F (30° C) and 90°F (32° C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32° C), reduce mixing and delivery time to 60 minutes.

## 2.04 ACCESSORIES

- A. Waterstop: 6" x 3/8", ribbed with center bulb, PVC waterstop as manufactured by Vinylex Corporation, or approved equal. Splicing shall be heat fused per manufacturer's recommendations.
- B. Bentonite Water Stop: RX101 waterstop by Volclay or approved equal.
- C. Preformed Bituminous Joint Filler: Resilient, non-extruding type premolded bituminous impregnated fiberboard units complying with AASHTO-M-213, ASTM D-1751, Federal Specification HH-F-341F, Type 1.
- D. Rubber Joint Sealant: The sealant shall be a multipart chemically curing polyurethane sealant which meets or exceeds the curing requirements of Federal Specification TT-S-00227D, (1) Type I (flow type) and Type II (nonsag type), Class A, (compounds resistant to 50 percent total joint movement). The color shall be gray to match concrete.
1. A primer shall be used as recommended by the sealant manufacturer. A bond breaker such as masking tape, polyethylene film, or backing rod as supplied by the manufacturer shall be used at the bottom of the joint.
  2. Multi-part, non-sag, urethane sealant. W.R. Meadows Dualthane, Percora Corp. Dynatrol II or approved equal.
- E. Concrete Joint Sealer, Poured Elastic Type
1. Hot-poured joint sealer shall conform to AASHTO M 173. The joint sealer shall be composed of a resilient and adhesive compound capable of effectively sealing joints in concrete against the infiltration of moisture and foreign material throughout repeated cycles of expansion and contraction with temperature changes. The material shall be capable of being brought to a uniform pouring consistency for completely filling the joints.
  2. Overheating of some joint materials may cause inadequate performance. Temperature control and mechanical agitation devices are recommended.
- F. Expansion Bolts: Shall be as follows (bolts, washers, and nuts shall be made of 304L stainless steel unless noted otherwise):

<u>Trade Designation</u>	<u>Manufacturer</u>
Star Slugin	Star Expansion Co. Mountainville, NY 10953
Rawl Multi-Calk	The Rawplug Co. 224 Peterson Road New Rochelle, NY 10802
Kwik-Bolt	Hilti Fastening Systems One Cummings Point Road Stamford, CT 06904
Expansive Screw Anchor	Ackerman-Johnson Co. 99 Commercial Drive Addison, IL 60101

Phillips Red Head Self Drilling Concrete Anchor	Phillips Drill Co. U.S. 12 and Liberty Trail Michigan City, IN 46360
Wej-IT	Wej-IT Corporation 500 Alter Street Broomfield, Co 80020
Cinch Expansion Anchor	Anchor Alloys, Inc. 966 Meeker Avenue Brooklyn, NY 11222

- G. Adhesive Anchors System: Shall be as follows (bolts, washers, and nuts shall be made of 304L stainless steel unless noted otherwise):

<u>Trade Designation</u>	<u>Manufacturer</u>
Redi-Chem Concrete Anchor System	Phillips Drill Co. U.S. 12 and Liberty Trail Michigan City, IN 46360
Rawl Chem-Stud Anchor System	The Rawlplug Co. 224 Peterson Road New Rochelle, NY 10802
HVA Adhesive Anchor System	Hilti Fastening Systems One Cummings Point Road Stamford, CT 06904

- H. Vapor barrier: Polyethylene film .006” thick, lapped 12” at laps.
- I. Grout: Shall be nonshrink grout; Embeco No. 636 or Masterflow No. 713 as manufactured by Master Builder or an approved equal.
- J. Epoxy Grout: Sikadur 32, high-mod, high-strength epoxy bonding/grouting adhesive.

PART 3 EXECUTION

3.01 FORMS

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf

wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

- E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- F. Form Ties: Factory-fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.
  - I. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is 1" inside concrete and will not leave holes larger than 1" diameter in concrete surface.
- G. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
- H. Cleaning and Tightening: Thoroughly clean forms and adjacent surface to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing as required to eliminate mortar leaks and maintain proper alignment.
- I. All curb and sidewalk replacement shall be completed in "full sections" to the nearest existing joint.

### 3.02 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- B. Before placing, clean surface to remove loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- F. Reinforcement shall not be bent or straightened in a manner injurious to the material.
- G. Reinforcement shall be secured in position and reviewed by the Engineer before pouring concrete.

### 3.03 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated.
- B. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs and between walls and footings.
- C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across

construction joints.

- D. Construction Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls and elsewhere as indicated.
- E. Dowel concrete road base to be replaced to existing concrete road base per the requirements of Delaware Department of Transportation (DELDOT) Specifications for Road and Bridge Construction, August 2001, latest edition.

### 3.04 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete.
  - 1. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.
- C. Pipe Sleeves: Where piping, as specified under Section 15000 and as shown on Drawings, is required to pass through concrete construction, furnish a sleeve in the concrete work.

### 3.05 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
  - 1. Thin form-coating compound only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come in contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
  - 2. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

### 3.06 CONCRETE PLACEMENT

- A. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
- B. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.
- C. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.
  - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which is hardened sufficiently to cause the formation of seams or planes of weakness.

If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
- E. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
- F. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators in lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- G. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
- H. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- I. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
- J. Maintain reinforcing in proper position during concrete placement operations.
- K. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
- L. When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C) at point of placement.
- M. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
- N. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
- O. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F (32°C). Mixing water may be chilled or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
- P. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
  - I. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.
- Q. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

## 3.07 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or hidden by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched. Fins and other projections exceeding 1/4" in height, shall be rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, such as waterproofing, dampproofing, painting or other similar system. Repair and patch defective areas. Fins or other projections shall be completely removed and smoothed.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

## 3.08 MONOLITHIC SLAB FINISHES

- A. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified.
  - I. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane, so that depressions between high spots do not exceed 5/16" under a 10' straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- B. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete slabs.
  - I. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.
- C. Concrete slab finish: To match adjacent surfaces.

## 3.09 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
  - I. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
  - 2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
  - I. Provide moisture curing by following methods.
    - a. Keep concrete surface continuously wet by covering with water.

- b. Continuous water-fog spray.
2. Provide moisture-cover curing as follows:
  - a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and end lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Provide curing and sealing compound to slabs, as follows:
  - a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
  - b. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Engineer.
4. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
  - a. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.
5. Sealer and Dustproofers: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

### 3.10 REMOVAL OF FORMS

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F (10°C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

### 3.11 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Engineer.

### 3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

- B. Reinforced Masonry: Provide concrete grout for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

### 3.13 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Engineer.
  - I. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
- B. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- C. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
- D. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- E. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plan to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.
- F. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
- G. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
- H. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operation by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Engineer.
- I. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- J. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland

cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact drypack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

- K. Perform structural repairs with prior approval of Engineer for method and procedure, using specified epoxy adhesive and mortar.
- L. Repair methods not specified above may be used, subject to acceptance of Engineer.

### 3.14 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. The Contractor shall employ a testing laboratory to perform tests and to submit test reports under the provisions of Section 01400.
- B. Sampling and testing for quality control during placement of concrete shall include the following, as directed by Engineer.
- C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
  - 1. Slump: ASTM C143; one test at point of discharge for the first batch of concrete each day, additional tests when concrete consistency seems to have changed. Test before and after the authorized addition of mix water. One test for each set of compressive strength test specimens.
  - 2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete, and one test for each set of compressive strength test specimens.
  - 3. Concrete Temperature: ASTM C1064, Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C) and above; each time a set of compressive strength test specimens are made and after authorized addition of mix water.
  - 4. Compressive Strength Tests: ASTM C 31; one set of four standard cylinders for each day's pour plus additional sets for each 25 cu. yds. over and above the first 50 cu. yds. of each concrete class placed in any one day; two specimens tested at 7 days, two specimens tested at 28 days.
    - a. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength tests meet or exceed the requirements of ACI 214 "Recommended Practice for Evaluation of Strength Test Results of Concrete", and ACI 318.
    - b. Mold and store cylinders for laboratory cured test specimens except when field cure test specimens are required.
- D. Test results will be reported in writing to Engineer and Contractor within 24 hours that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Engineer. Testing service may conduct tests to determine adequacy of concrete by

cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

END OF SECTION 03300 – CAST IN PLACE CONCRETE

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**SECTION 03400- PRECAST CONCRETE**

## PART 1 GENERAL

## 1.01 WORK INCLUDES

- A. Precast concrete structures.

## 1.02 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ASTM C890 Standard Practice for Minimum Structural Design Loading for Monolithic or Section Precast Concrete Water and Wastewater Structures.
- D. ASTM C913 Standard Specification for Precast Water and Wastewater Structures.
- E. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- F. ASTM A307 - Specification for Low-Carbon Steel Externally and Internally Threaded Standard Fasteners.
- G. ASTM A325 - Specification for High Strength Bolts for Structural Steel Joints, Including Suitable Nuts and Plain Hardened Washers.
- H. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- I. ASTM C33 - Concrete Aggregates.
- J. ASTM C150 - Portland cement.
- K. ASTM C260 - Air Entraining Admixtures for Concrete.
- L. ASTM C330 - Lightweight Aggregates for Structural Concrete.
- M. ASTM C494 - Chemical Admixtures for Concrete.
- N. PCI MNL-116 - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.

- O. PCI MNL-120 - Design Handbook - Precast and Prestressed Concrete.
- P. PCI MNL-123 - Manual on Design of Connections for Precast Prestressed Concrete.
- Q. PCI MNL-127 - Manual on Recommended Practice for Erection of Precast Concrete.
- R. Concrete Reinforcing Steel Institute, "Manual of Standard Practice."
- S. The most stringent code shall govern.

#### 1.03 QUALITY ASSURANCE

##### A. Testing:

- 1. Certification from independent testing agency supplied by the manufacturer.
- 2. Cost of Testing: Borne by Contractor.

##### B. Codes and Standards:

- 1. Except as modified by the requirements specified herein and/or the details shown on the Project Drawings, all work included in this section shall conform to the applicable provisions of the following codes and standards:
  - a. ACI 301
  - b. ACI 318
  - c. ASTM C890
  - d. ASTM C913
  - e. PCI MNL-116
  - f. PCI MNL-120
  - g. PCI MNL-123
  - h. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

#### 1.04 STRUCTURAL DESIGN REQUIREMENTS

- A. The Contractor shall address all anticipated loading conditions as indicated on the Drawings, as specified herein, and as required by local and state building codes. All load cases shall be considered and the design shall be based on the governing cases which produce the greatest stresses on the structure. Load cases to be addressed include:

1. Structure empty with saturated soil outside.
  2. Structure full with saturated soil outside.
  3. Structure full with dry soil outside.
  4. Structure full with no soil pressure outside.
- B. Maximum ground water elevation shall be assumed to be at finish grade level. Saturated soil shall be assumed to exert a minimum equivalent fluid pressure of 90 p.c.f. onto the structure.
- C. All structures shall be designed to resist buoyancy when empty. The minimum safety factor against buoyancy shall be 1.25. Only the weight of the empty concrete structure and the weight of the soil directly above the anti-flotation collar shall be considered in calculating the forces to resist buoyancy. The dry density of the soil shall be assumed at 100 lbs./cu.ft. The density of concrete shall be assumed to be 150 lbs.cu.ft.
- D. Effects of all vertical, horizontal and lifting loads anticipated on the finished structure shall be included in the analysis and design. Loading from piping and equipment, snow, and adjacent H-20 live load shall be included.
- E. All structures shall be watertight.
- F. Where conditions arise which are not specifically covered by these notes and specifications, the Current Standards of ACI 301, 304, 306, 311, 315, 318, ASTM C-94, C890 and C913 shall govern.
- G. Design calculations for the above conditions shall be prepared, signed and sealed by a Registered Professional Engineer, registered in the State of Delaware and submitted to the Engineer for review.

#### 1.05 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01300.
- B. Submit design calculations and shop drawings indicating fabrication details, reinforcement, connection details, support items, member cross-sections and dimensions, gaskets, openings, manhole steps, size and type of reinforcement and lifting devices which shall be signed and sealed by a Professional Engineer licensed in the State of Delaware.
- C. Indicate design loads, deflections, cambers, bearing requirements, and special conditions.
- D. Submit product data under provisions of Section 01300.

- E. Submit product data indicating standard component configurations, design loads, deflections, cambers, and bearing requirements.
- F. Submit data on proposed used of any admixture under provisions of Section 01300.
- G. Submit fabricator's installation instructions under provisions of Section 01300.
- H. Submit design data under provisions of Section 01300.
- I. Submit design data reports indicating calculations for loadings and stresses of fabricated, designed framing.

#### 1.06 QUALIFICATIONS

- A. Fabricator: Company specializing in manufacturing the work of this Section with minimum three years documented experience.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site at such times to assure continuity of installation.
- B. Handle precast members in position consistent with their shape and design. Lift and support only from support points.
- C. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage transportation, erection.
- D. Store and protect members to prevent staining, cracking, chipping, spalling, or other physical damage of concrete.
- E. Mark each member with date of production and final position in structure.

### PART 2 PRODUCTS

#### 2.01 CONCRETE MATERIALS

- A. Water: Clean and free of organic materials, strong acids or alkalis, oils and salt. Potable.
- B. Portland Cement ASTM-C150, Type I or Type III American manufacture. One (1) brand used throughout project.

- C. Sand: (Fine aggregate) shall be clean, sharp, coarse, (minimum fines) hard, natural sand free from salt, loam, clay and other deleterious materials and shall conform to ASTM Specification C33 or C330.
- D. Coarse Aggregate: Shall be well graded, washed gravel or crushed stone and shall conform to ASTM Specification C33 for normal weight aggregate.
- E. Admixtures: Determined by precast fabricator as appropriate to design requirements and conforming to ASTM Specification C494.

## 2.02 REINFORCEMENT

- A. Reinforcing Steel: Reinforcing bars shall be deformed high strength bars conforming to ASTM A615, Grade 40 or 60.
- B. Welded Wire Fabric: Fabric shall conform to ASTM A185.

## 2.03 FORMWORK

- A. Forms: Wood, metal, plastic, or other acceptable material that will produce required finish surfaces and is non-reactive with concrete.
- B. Maintain formwork to provide completed precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified in PCI MNL-116.

## 2.04 ACCESSORIES

- A. Grout: Non-shrink, non-metallic, pre-mixed, non-corrosive, non-staining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water reducing agents. Minimum yield strength of 10,000 psi at 28 days.
- B. High Strength Threaded Fasteners: As shown on drawings or heavy hexagon structural bolts, heavy bolts, and hardened washers complying with ASTM A325. Exposed units galvanized per ASTM A153; others painted with rust-inhibitive primer.
- C. Anchor Bolts, Nuts and Washers: As shown on drawings or low-carbon steel bolts, regular hexagon nuts and carbon steel washers conforming to ASTM A307. Exposed units galvanized per ASTM A153; others painted with rust-inhibitive primer.
- D. Supports for Reinforcement: Provide bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing in accordance with CRSI and ACI recommendations.

- E. Gaskets: Pipe penetrations in precast structures shall be constructed with integrally cast rubber or neoprene gaskets unless otherwise indicated. Integrally cast gaskets shall be Dura Seal III, A-lok, Dual Seal or approved equal.
- F. Wall sleeves: Where indicated on the Drawings, precast structures shall have integrally cast mechanical joint wall sleeves. Integrally cast wall sleeves shall be cast iron Clow F-1429, Omni-Sleeve, or approved equal.
- G. Plastic coated steel steps: Manhole steps made by M.A. Industries, Inc. Peachtree City, GA. or approved equal.
- H. All steps shall be capable of resisting the following loads without loosening or damage.
  - 1. Minimum horizontal pull out load 400 lb.
  - 2. Minimum vertical load 800 lb.
- I. Joint Sealant: Watertight sealant shall be installed between all precast sections. Ramsneck mastic tape or approved equal.

## 2.05 FABRICATION

- A. Fabrication procedure to conform to PCI MNL-116.
- B. Maintain plant records and quality control program during production of precast members. Make records available upon request.
- C. Reinforcing steel surface shall be free of rust, mill scale and any coating including ice that could destroy or reduce bond.
- D. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are embedded and located as indicated on shop drawings. Locate anchors where they do not affect position of main reinforcement or placing of concrete.
- E. Tension reinforcement tendons as required to achieve design load criteria.
- F. Cast-in required openings with a dimension larger than 6 inches or where indicated on Drawings.
- G. Concrete Strength: Minimum ultimate compressive strength of the concrete at age 28 days shall be 5000 psi. Slump shall not exceed 4 inches.

## 2.06 FINISHING

- A. Ensure exposed-to-view finish surfaces of precast concrete members are uniform in color and appearance.
- B. Cure members under ideal conditions to develop required concrete quality, and minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
- C. Interior and exterior above grade surfaces - Exposed-to-View Finish: Normal plant finish with fins and protrusions removed, ground edges and ends, and flat face surfaces.
- D. Exterior below grade surfaces - Normal plant finish; normal form joint marks, small surface holes caused by air bubbles, minor chips, and spalling at edges or ends, without major discoloration will be tolerated, but no major or unsightly imperfections, honeycomb or structural defects will be permitted.

## PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify that site conditions are ready to receive work and field measurements are as on Drawings.
- B. Ensure excavation is free of water and precast units will not be placed on frozen or soft ground.
- C. Beginning of installation means installer accepts existing conditions.

## 3.02 PREPARATION

- A. Prepare support equipment for the erection procedure, temporary shoring and bracing, and induced loads during erection.

## 3.03 INSTALLATION

- A. Install precast units according to manufacturer's recommendations and the Drawings without damage to structural capacity, shape, or finish. Replace or repair damaged members.
- B. Align and maintain uniform horizontal and vertical joints, as erection progresses.
- C. Maintain temporary bracing in place until final support is provided. Protect members from staining.

- D. Grout open spaces at connections and joints. Provide forms or other acceptable method to retain grout in place until sufficiently hard to support itself. Pack spaces with stiff grout material, tamping until voids are completely filled. Place grout to finish smooth, plumb and level with adjacent concrete surfaces. Keep grouted joints damp for not less than 24 hours after initial set. Promptly remove grout material from exposed surfaces before it hardens.
- E. Do not use power-actuated fasteners for surface attachment of accessory items in precast, prestressed unit unless otherwise accepted by precast manufacturer.

#### 3.04 TESTING

- A. All precast structures designed to retain fluids, including manholes, shall be tested for leaks.

#### 3.05 ERECTION TOLERANCES

- A. Erect members level and plumb within allowable tolerances.
- B. Conform to PCI MNL-127.

END OF SECTION 03400 – PRECAST CONCRETE

**SECTION 15000- PIPING AND VALVING**

## PART 1 GENERAL

Contractor shall furnish, install and test the type of pipe shown on the Contract Drawings.

## 1.01 WORK INCLUDED

- A. Pipe and fittings
- B. Valves
- C. Wall pipe and sleeves
- D. Hangers and supports
- E. Adaptors and couplings

## 1.02 REFERENCE STANDARDS

- A. BOCA National Standard Plumbing Code
- B. AWWA C104, C110, C111, C150, C151 and C600 for DIP with cement mortar lining, fittings, rubber-gasketed joints and installation.
- C. AWWA C900, ASTM C564, D1784, DI785, D224I, D3I39, F477, ANSI/ASTM 232I, D2729, for PVC water and sewer pipe, fittings, joints, gaskets and installation.
- D. AWWA C500 for gate valves.
- E. ASTM D638 – Test method for Tensile Properties of Plastics.
- F. ASTM D790 - Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- G. ASTM D1238 - Test Method for Flow Rates of Thermal Plastics Molding and Extrusion Materials.
- H. ASTM D1505 - Test Method for Density of Plastics by the Density Gradient Technique.
- I. ASTM D1599 - Test Method for Short Time Hydraulic Failure Pressure of Plastic Pipe materials.
- J. ASTM D1693 - Test Method for Environmental Stress Cracking of Ethylene Plastics.
- K. ASTM D2122 - Method for Determining Dimensions of Thermal Plastic Pipe and Fittings.
- L. ASTM D2837 - Method for Obtaining Hydrostatic Design Basis for Thermal Plastic Pipe Materials.
- M. ASTM D3350 - Polyethylene Plastics Pipe and Fitting Material.
- N. ASTM F714 - Polyethylene (PE) Plastic Pipe Based on Outside Diameter.
- O. ASTM F1248 - Determination of Environmental Stress Crack Resistance (ESCR) of Polyethylene Pipe.

- P. ASTM D4218 - Test method for Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.
  - Q. ASTM D1248 - Specification for Polyethylene Plastics Molding and Extrusion Material.
  - R. ASTM D2240 - Test method of Rubber Property - Durometer Hardness.
  - S. ASTM D695 - Test method for Compressive Strength of Rigid Plastics.
  - T. ASTM D256 - Test method for Impact Resistance of Plastics and Electrical Insulating Material.
  - U. ASTM D696 - Test method of Coefficient of Linear Thermal Expansion of Plastics.
  - V. ASTM C177 - Test method for Steady-State Heat Flux Measurement and Thermal Transmission Properties by Means of the Guarded-Hot-Plat Apparatus.
  - W. ASTM D746 - Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
  - X. ASTM D152S - Test Method for Vicat Softening Temperature of Plastics.
  - Y. ASME B 31.8 x N Hydrostatic Testing Guidelines.
  - Z. AWWA C901 - Polyethylene Pressure Pipe, Tubing and Fittings, 1/2" through 3" for Water.
  - AA. AWWAC 906 - Polyethylene (PE) Pressure Pipe and Fittings. 4" through 63" for Water Distribution.
  - BB. NSF Std. #14 - Plastic Piping Components & Related Materials.
  - CC. ASTM D2239 - Polyethylene Plastic Pipe (SIDR-PR). (Iron Pipe Size, Inside Diameter).
  - DD. ASTM D-2657 - Guideline for Polyolefin Thermoplastic Butt Fusion Heat Welding.
  - EE. ASTM D-2737 - Polyethylene Plastic Tubing (Copper Tube Size; Outside Diameter).
  - FF. ASTM D-3035 - Specification for Polyethylene (PE) Plastic (DR-PR) Based on Controlled Outside Diameter (1/2" to 24")
  - GG. FM, Factory Mutual Approved.
  - HH. Plastic Piping Institute Best Practices TR 31/9-79
  - II. MSS-SP67
  - JJ. MSS-SP25
  - KK. API-609
- 1.03 QUALITY ASSURANCE
- A. Materials shall conform to manufacturer's specifications and instructions.
- 1.04 SUBMISSIONS
- A. Submit samples, manufacturer's product data and installation instructions in accordance with Section 01300.

## PART 2 PRODUCTS

## 2.01 MANUFACTURERS

- A. Where manufacturer's products are specified, it is for the purpose of establishing a standard of quality and construction.
- B. Equivalent products of other manufacturers may be substituted under the provisions of the bidding documents, Section 01300, and Section 01600, 6.3 Substitutions.

## 2.02 DUCTILE CAST IRON PIPE (DIP)

- A. Ductile cast iron pipe shall conform to AWWA C150 and AWWA C151 and shall have an ANSI Class 52 minimum thickness unless otherwise specified.
- B. All buried pipe shall receive an outside bituminous seal coat and cement interior lining. Above ground or exposed piping shall be uncoated and suitable for painting.
- C. Above ground or exposed ductile cast iron pipe shall be flanged. Buried ductile cast iron pipe shall have push-on joints or mechanical joints. Rubber gaskets shall conform to AWWA C111 for mechanical and push-on joints.
- D. Ductile cast iron fittings shall conform with the "Standard Specifications for Ductile Cast Iron Pipe and Special Castings" for Class D fittings. Interior of fittings shall be lined with factory applied Protecto 401 coating.
- E. All gaskets between flanged connections and fittings shall be non-asbestos composition minimum thickness of 1/8", and shall be coated with thread lubricant prior to making up joints. Flange bolts, nuts and washers shall be of mild steel with sound, well-fitted threads, the nuts shall be cold-punched, hexagonal, trimmed, and chamfered. Heads, nuts and threads shall be United States standard sizes. Bolts shall be of such length as to project one-quarter inch beyond the nut when the flanged joint with gasket is assembled.

## 2.03 PVC PIPE – SCHEDULE 40 AND 80

- A. Pipe shall meet the requirements of ASTM D1785, Schedule 40 or Schedule 80 where indicated on Drawings. Fittings, etc. shall meet the requirements of ASTM D2466, D2467, or D2464 Type 1, Grade 1.
- B. Schedule 40 PVC and fittings pipe shall be solvent cemented and the cement shall conform to ASTM D2564. Schedule 80 PVC pipe and fittings may be solvent cemented or threaded.

## 2.04 PVC PIPE – AWWA C900

- A. Force main pipe shall be of size shown on Drawings, manufactured in accordance with AWWA C900 for PVC pressure pipe with O.D. of cast iron pipe. Joints shall be gasketed bell and spigot push-on. Gaskets shall comply with ASTM F477 "Standard Specifications for Elastomeric Seals for Joining Plastic Pipe". All joints shall meet with requirements of ASTM D3139. "Standard Specification for Joints for Plastic Pressure Pipe Using Flexible Elastomeric Seals".
- B. Wall thickness shall be DR18 pressure Class 150. Pipe shall be clearly marked with DR number and size. Pipe shall be as supplied by Certainteed or equal.
- C. Fittings shall be DIP with factory applied interior Protecto 401 Coating unless otherwise noted on the Drawings.

## 2.05 PVC GRAVITY PIPE

- A. PVC pipe compound shall conform to ASTM D1784. "Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds".
- B. PVC pipe eight inches and larger shall conform to ASTM D3034, SDR 35, Type PSM, with integral bells meeting requirements of ASTM D3212. Rubber gaskets shall conform to ASTM F477.
- C. Fittings for PVC pipe eight inches and larger shall conform to ASTM D3034, SDR 35, Type PSM. Joints shall meet requirements of ASTM D3212 and gaskets shall conform to ASTM F477.
- D. Pipe and fittings shall be manufactured by CertainTeed Corporation; J-M Manufacturing Company, Inc. or equal.

## 2.06 FITTINGS AND JOINTS

- A. Unless otherwise specified, fittings shall be in general, of the same material, weight and class and shall have the lining and coating as the pipelines in which they are installed.

## 2.08 UNDERGROUND WARNING TAPE

- A. A metallic lined underground warning tape shall be placed over the entire length of all buried pipe. The tape shall be 3" color green, with the message "Buried Sewer Line Below". Tape shall be equal to "Seton Nameplate Corporation" detection tape printed on polyethylene with a metallic core.

## 2.09 Couplings

- A. Couplings shall be manufactured to meet the material requirements of CSA B602A, ASTM C 1173 with stainless steel components as manufactured by Fernco Model Strong Back RC Couplings or approved equal.

## PART 3 EXECUTION

## 3.01 SEWER (NON-PRESSURE) PIPE INSTALLATION

- A. No pipework is to be started until all materials, layout, schedules, stakeout, and cut sheets have been approved by the Engineer in writing. Samples of all materials to be incorporated in the Work shall be submitted for the approval of the Engineer sufficiently in advance of Work commencement to allow time for specified testing. Sewer pipe alignment shall be maintained through the use of laser alignment equipment. All installation shall follow the requirements of ASTM D2321.
- B. Proper and suitable tools and equipment for the safe and convenient handling and laying of the pipe and fittings shall be used in accordance with manufacturer's standards. Pipe and fittings shall be carefully handled and lowered into the trench.
- C. Whenever a pipe requires cutting to fit in the line or to bring it to the required location, the Work shall be done without extra compensation, in a satisfactory manner so as to leave a smooth end perpendicular to the axis of the pipe.
- D. Before any joints are actually made in the trench, the Contractor shall demonstrate to the Engineer, by making a sample joint, that the methods he will employ conform with specifications and will secure a watertight joint, and that the workmen whom he intends to use in this Work are familiar with the requirements.

- E. All laying, jointing, testing for defects and for leakage shall be performed in the presence of the Engineer. All defects in workmanship rejected by the Engineer shall be promptly corrected by the Contractor and defective material removed from the Project.
- F. The excavation in which pipe is being laid shall be kept free from water, and no joint shall be made under water. Care shall be used to secure water-tightness and to prevent damage to, or the disturbing of, the joints during the backfilling process or at any other time. After pipes have been laid and the joints have been made, there shall be no walking on or working over them except as may be necessary in tamping until there is a covering at least two (2) feet in depth over their top. After joint materials, which require it, have received their set, backfilling of the trench may proceed in the manner specified.
- G. Before joints are made, each pipe shall be well bedded on a solid foundation and no pipe shall be brought into position until the preceding length has been thoroughly embedded and secured in place. No pipe shall be laid in wet trench conditions that preclude proper bedding, or on a frozen trench bottom, or when in the opinion of the Engineer, the trench or weather conditions are unsuitable for proper installation. Any defects due to settlement shall be corrected by the Contractor at his own expense. Bell holes or coupling holes shall be dug sufficiently large to insure making of proper joints. In no case will pipe be closer than four (4) inches from bedrock.
- H. In laying pipe, special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the pipeline.
- I. No wedging or blocking will be permitted in laying pipe unless by written order from the Engineer.
- J. Pipes and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed Work. The open end shall be kept closed with a stopper until the next length is laid. At the close of work each day, the end of the pipeline shall be tightly closed with an expansion stopper so that no dirt or other foreign substances may enter the line, and this stopper shall be kept in place until pipe laying is again resumed.
- K. Cold weather protection shall be provided, during freezing weather, for all masonry, mortar and concrete construction connected with the exterior piping by maintaining a temperature of not less than 50°F for a period of three (3) days, or by backfilling immediately, or by covering with backfill material in a temporary manner, all as directed by the Engineer.
- L. All open ends of pipelines to be abandoned, exposed during construction operations, shall have their openings plugged with a two (2) foot minimum thickness of concrete.
- M. All dead-ends of pipelines, and fittings, shall be provided with standard plugs and caps either temporarily or permanently as directed by the Engineer. A concrete or other approved thrust blocking shall be provided at all dead ends. Where plugged or capped outlets are to be tied to fittings with clamps and tie rods, as indicated on the Contract Documents or as directed by the Engineer, the minimum number and size of rods and other pertinent details shall be as shown and/or specified.
- N. Manholes shall be built as pipe laying progresses, and the Engineer may stop work entirely on laying pipe until the manhole just passed has been completed.

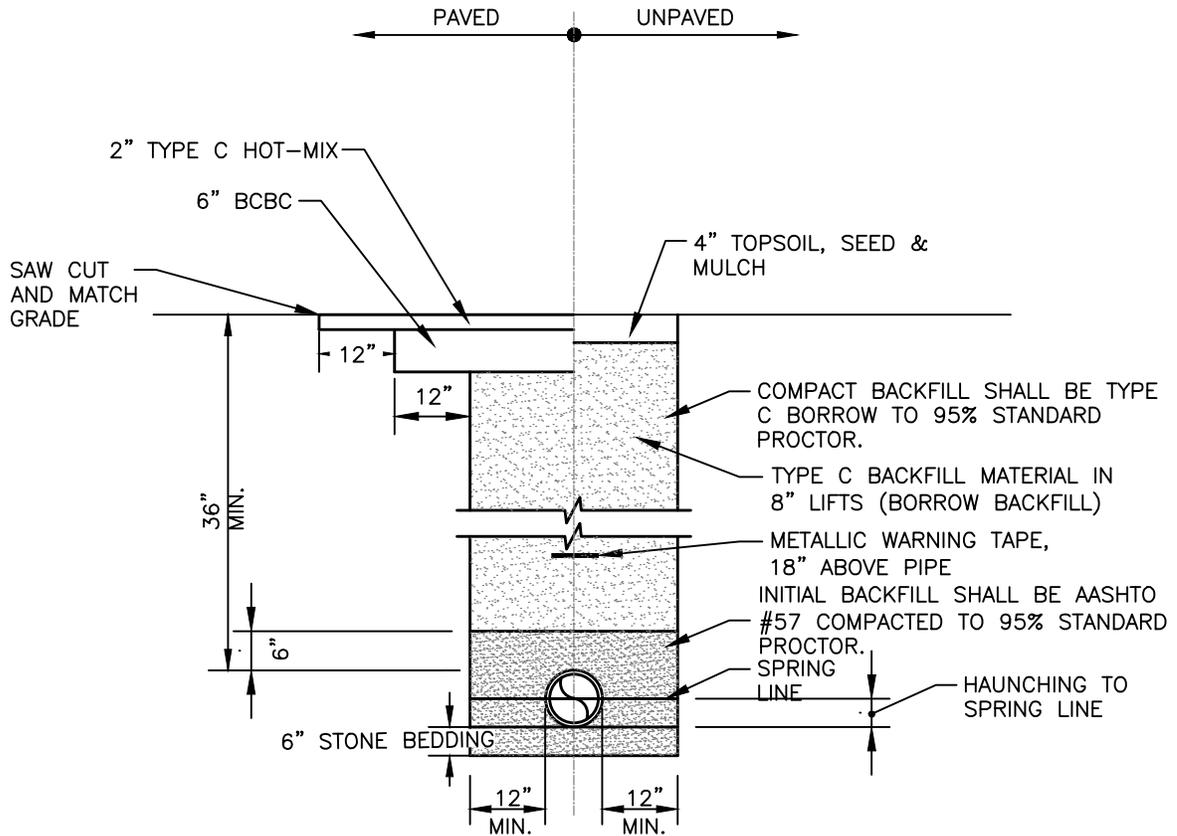
END OF SECTION 15000 – PIPING AND VALVING

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**Appendix A**  
**Drawing Details**

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\*NOTE:  
PAVING RESTORATION SHALL MEET MINIMUM THICKNESS SHOWN OR MATCH EXISTING CONDITIONS, WHICHEVER IS GREATER.

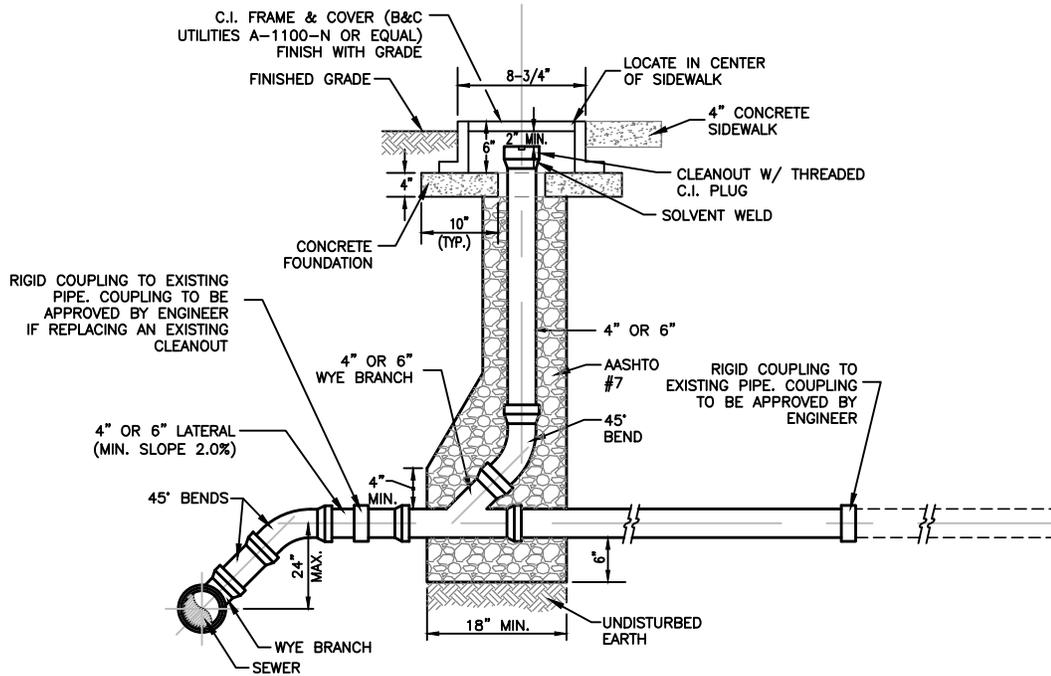


**NOTES:**

1. BEDDING, HAUNCHING AND FILL MATERIAL TO 6" ABOVE THE TOP OF PIPE SHALL BE AASHTO #57 COMPACTED TO 95% STANDARD PROCTOR AGGREGATE MEETING THE REQUIREMENTS OF ASHTO M43, SIZE NUMBER 57. PRIOR TO PIPE INSTALLATION, CAREFULLY BRING THE 6" OF BEDDING MATERIAL TO GRADE ALONG THE ENTIRE LENGTH OF PIPE TO BE INSTALLED, LITTLE OR NO COMPACTION IS REQUIRED DUE TO THE ANGULAR NATURE OF THE PARTICLES. IF TRENCH BOTTOM CONDITIONS SO WARRANT, MORE THAN 6" OF BEDDING MAY BE REQUIRED.
2. DURING HAUNCHING, CONTRACTOR SHALL CAREFULLY WORK GRAVEL DOWN AROUND THE BOTTOM OF THE PIPE.
3. A METALLIC LINED UNDERGROUND WARNING TAPE SHALL BE PLACED 18" ABOVE THE ENTIRE LENGTH OF ALL BURIED SEWER PIPE. THE TAPE SHALL BE 6", METALLIC CORE, COLOR GREEN, MARKED "BURIED SEWER LINE BELOW". TAPE SHALL BE EQUAL TO "SETON NAMEPLATE CORPORATION".
4. PLACE "DAMS" IN BEDDING BETWEEN MANHOLES AND AT A MINIMUM OF 200 FEET APART. DAMS TO REPLACE STONE FOR 2 FEET OF PIPE LENGTH AND BE TYPE D MATERIAL.

	<b>GRAVITY SEWER MAIN AND LATERAL TRENCH DETAIL</b>	<b>REVISED</b>
		<b>4</b>

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**NOTES:**

1. CLEANOUT SHALL BE PLUMB.
2. EXISTING PIPE MAY BE AC, VCP, CAST IRON, PVC OR ORANGEBERG.
3. SUITABLE DRESSER STYLE RIGID COUPLINGS ARE TO BE PROVIDED BY THE CONTRACTOR.

## TYPICAL LATERAL CLEANOUT

NOT TO SCALE

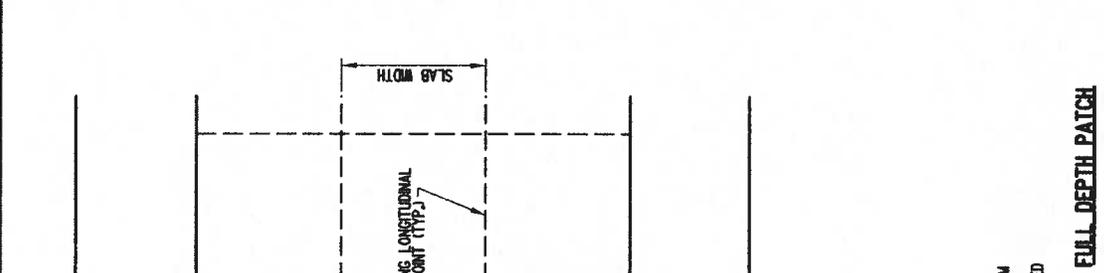
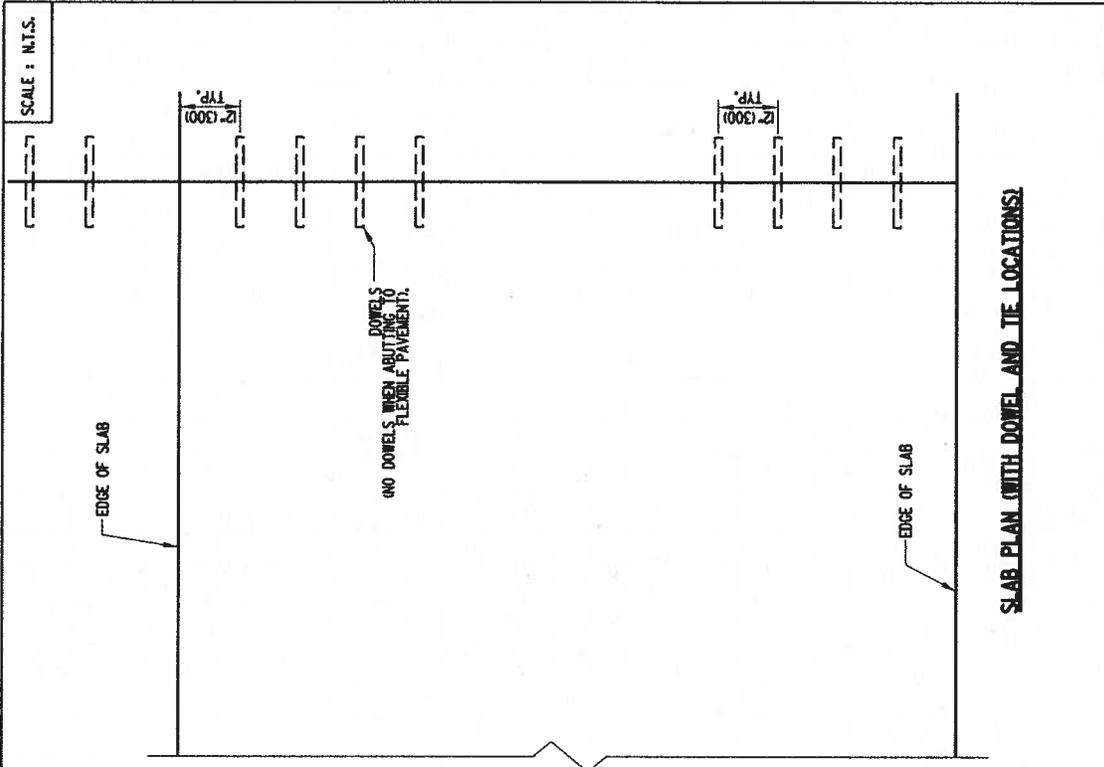
	<p>STANDARD SEWER &amp; WATER DETAILS</p> <p><b>TYPICAL LATERAL CLEANOUT AND LATERAL CLEANOUT REPLACEMENT</b></p>	<p>REVISED</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>								
		<p><b>6</b></p>								

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**Appendix B**

**P.C.C. Pavement Patching Details**

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SCALE : N.T.S.

SLAB PLAN WITH DOWEL AND JTE LOCATIONS!

**PLAN**

\* - PROPOSED LOCATIONS FOR TRANSVERSE JOINTS SHALL EXACTLY MATCH THE ALIGNMENT OF THE FINAL EXISTING OR RELOCATED TRANSVERSE JOINTS IN ALL IMMEDIATELY ADJACENT LANES.

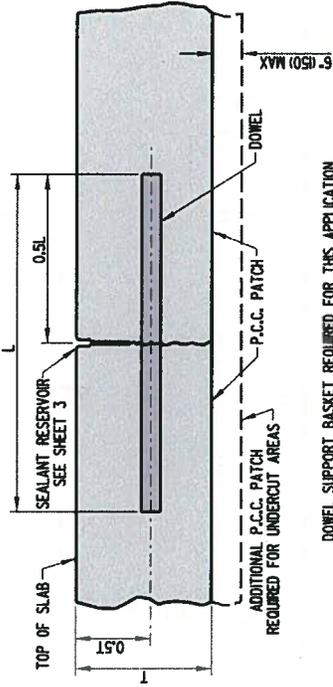
- NOTES:
1. WHEN REPAIRING EXISTING TRANSVERSE JOINTS, THE PATCH SHALL EXTEND A MINIMUM OF 24" (600) THROUGH THE EXISTING JOINT, WHICH WILL RELOCATE THE JOINT.
  2. PROPOSED LOCATIONS FOR TRANSVERSE JOINTS, WHEN NOT ALIGNED WITH THE FINAL EXPECTED TRANSVERSE JOINT LOCATIONS IN THE IMMEDIATELY ADJACENT LANES, SHALL BE OFFSET A MINIMUM OF 2' (600) FROM THE AFFORMENTIONED JOINTS.
  3. THE LONGITUDINAL JOINT ALIGNMENT SHALL BE STRAIGHT AND CONTINUOUS THROUGH THE REPAIRED AREA.

**FULL DEPTH PATCH**

	<b>DELAWARE</b> <b>DEPARTMENT OF TRANSPORTATION</b>		<b>P.C.C. PAVEMENT PATCHING</b>		<b>APPROVED</b>	<b>1/18/08</b> <small>DATE</small>
	<b>STANDARD NO. P-2 (3008)</b>	<b>SHT. 1</b>	<b>OF 5</b>	<b>RECOMMENDED</b>	<small>CHIEF ENGINEER</small> <i>[Signature]</i>	<small>DATE</small> <b>1/17/08</b>

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SCALE : N.T.S.

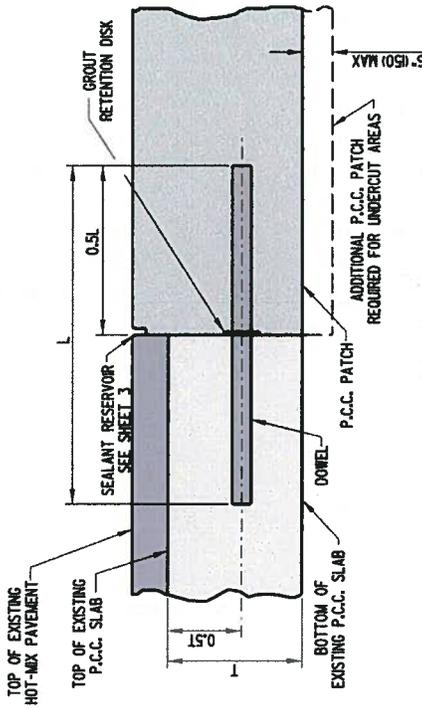


**SECTION A-A**

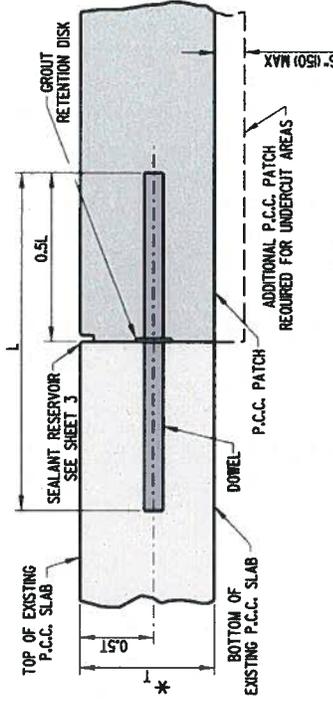
DOWEL SUPPORT BASKET REQUIRED FOR THIS APPLICATION  
(REFER TO STANDARD CONSTRUCTION DETAIL FOR P.C.C. PAVEMENT.)

**SECTION B-B**

TRANSVERSE SAW-CUT USED FOR  
JOINTS LOCATED WITHIN THE PATCH



**EXIST. HOT-MIX OVER P.C.C. PAVEMENT**



**EXIST. P.C.C. PAVEMENT**

**NOTES:**

- 1) \* T = 12", CONTRACTOR SHALL FIELD VERIFY
- 2) CLASS A CONCRETE PER DELDOT STANDARD SPECIFICATIONS, SECTION 503 - PATCHING PORTLAND CEMENT CONCRETE PAVEMENT TO ANY EXISTING EXPANSION JOINTS LOCATED WITHIN OR ADJACENT TO THE PATCH AREA SHALL BE REPLACED IN KIND. SUBMIT EXPANSION JOINT MATERIAL PRODUCT DATA FOR APPROVAL BY ENGINEER. WHERE EXISTING PAVEMENT IS P.C.C. OVERLAD WITH ASPHALT, THE PATCH SHALL CONSIST OF P.C.C. OVERLAD WITH ASPHALT.
- 3)
- 4)

**SECTION C-C**

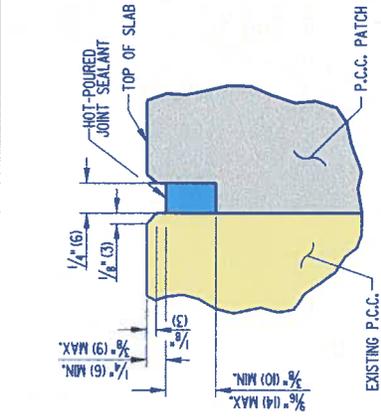
TRANSVERSE CONSTRUCTION JOINT USED ON  
JOINTS BETWEEN EXISTING PAVEMENT AND PATCH

**FULL DEPTH PATCH**

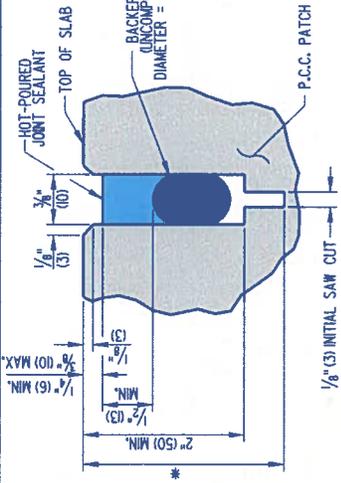
 <p><b>DELAWARE</b> <b>DEPARTMENT OF TRANSPORTATION</b></p>	<p>P.C.C. PAVEMENT PATCHING</p>		<p>STANDARD NO. P-2 (3000)</p>	
	<p>SHT. 2</p>	<p>OF 5</p>	<p>APPROVED</p> <p><i>[Signature]</i> DATE 11/18/08</p>	<p>RECOMMENDED</p> <p><i>[Signature]</i> DATE 11/17/08</p>

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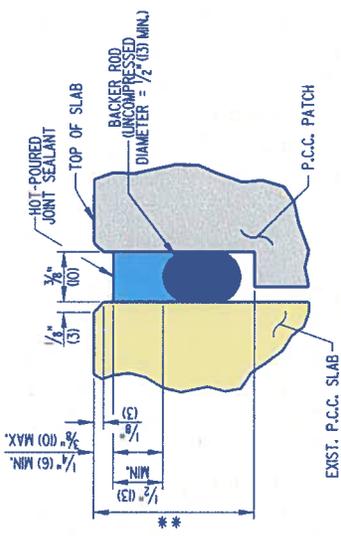
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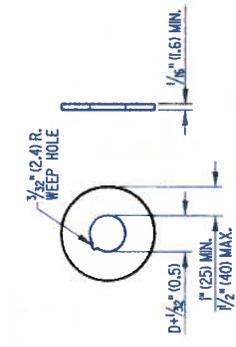
**SEALANT DETAIL -  
LONGITUDINAL JOINT**



**SEALANT DETAIL -  
TRANSVERSE SAW-CUT JOINT**



**SEALANT DETAIL -  
TRANSVERSE CONSTRUCTION JOINT**



**DOWEL BAR**

D - DOWEL DIAMETER (INCLUDING PROTECTING COATINGS, IF ANY.)

**GROUT RETENTION DISK**

NOTES:

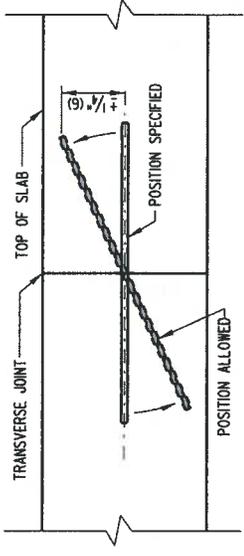
1. AS DIMENSIONED, THE WIDTH OF THE TRANSVERSE SEALANT RESERVOIR IS APPLICABLE WHEN THE TEMPERATURE OF THE PAYMENT SURFACE IS BETWEEN 60°F (16°C) AND 80°F (27°C). WHEN THE TEMPERATURE IS BELOW 60°F (16°C), THE SEALANT RESERVOIR SHALL BE CUT 1/16" (2) WIDER. WHEN THE TEMPERATURE IS ABOVE 80°F (27°C), THE SEALANT RESERVOIR SHALL BE CUT 1/16" (2) NARROWER.
2. "T" REFERS TO THE EXISTING "AS-BUILT" SLAB THICKNESS.
3. TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS SHOWN WITHOUT RANGES SHALL BE PLUS/1/16" (2), MINUS 0" (0).
4. THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR SHALL BE AT THE SAME ELEVATION.

**FULL DEPTH PATCH**

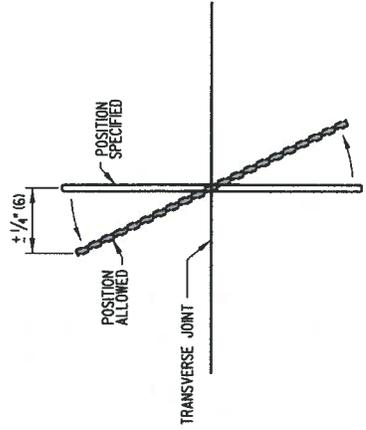
 <b>DELAWARE DEPARTMENT OF TRANSPORTATION</b>	P.C.C. PAVEMENT PATCHING		APPROVED <i>Carolina White</i> 1/10/05 <small>DATE</small>	
	STANDARD NO. P-2 (2000)	SHT. 3	OF 5	RECOMMENDED <i>Dennis M. O'Neil</i> 1/13/05 <small>DATE</small>

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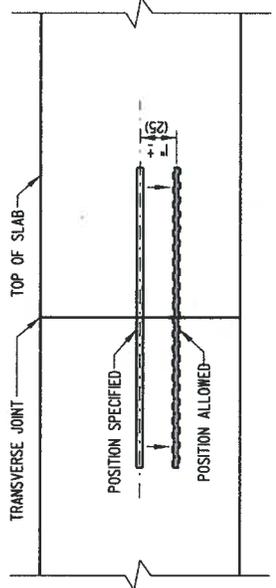
SCALE : N.T.S.



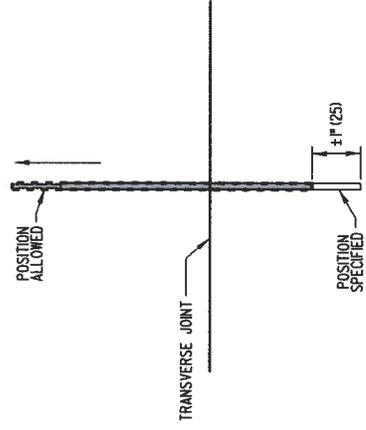
VERTICAL ROTATION



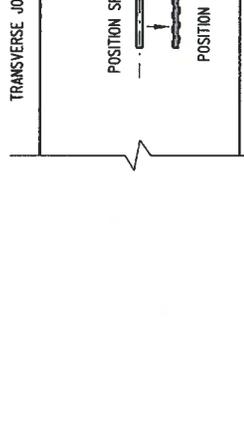
HORIZONTAL ROTATION



VERTICAL TRANSLATION



LONGITUDINAL TRANSLATION



HORIZONTAL TRANSLATION

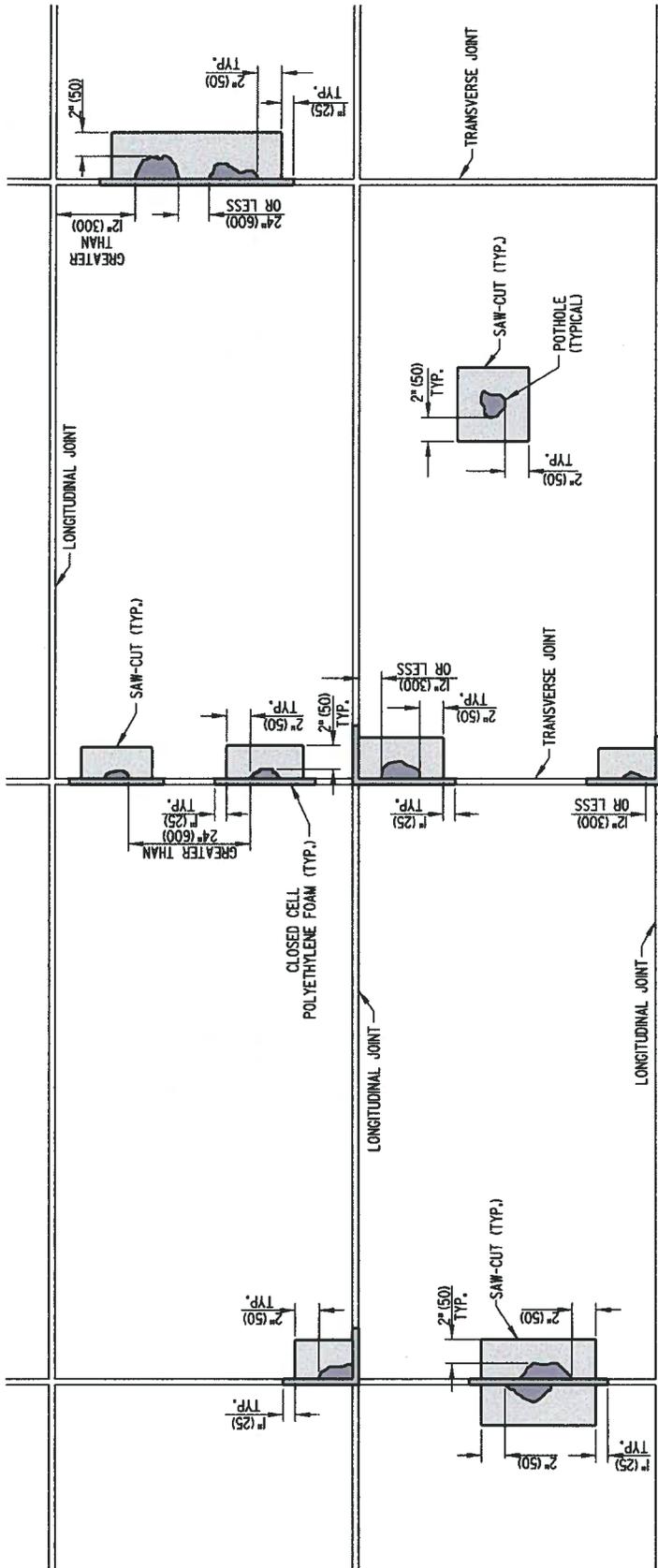
DOWEL & TIE BAR PLACEMENT TOLERANCES

FULL DEPTH PATCH

 DELAWARE DEPARTMENT OF TRANSPORTATION	STANDARD NO. P-2 (2001)	P.C.C. PAVEMENT PATCHING	SHT. 4 OF 5	APPROVED <i>Ernest M. Hurlbush</i> <small>CHIEF ENGINEER</small>	DATE <i>6/18/01</i>
	RECOMMENDED <i>Michael J. [Signature]</i> <small>DESIGN ENGINEER</small>	FULL DEPTH PATCH	DATE <i>6/18/01</i>		

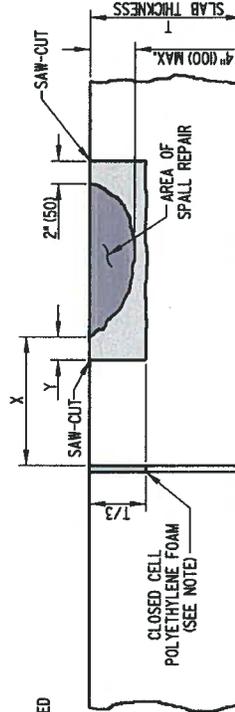
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SCALE: 1" = 12" (S)



**PLAN**

**NOTE:** CLOSED CELL POLYETHYLENE FOAM SHALL BE THE SAME WIDTH AS THE JOINT AND 5" (125) IN DEPTH. AFTER THE CONCRETE IN THE REPAIR AREA HAS ACHIEVED THE SPECIFIED STRENGTH, THE FOAM SHALL BE REMOVED AND REPLACED WITH BACKER ROD AND HOT-POUR SEALANT MEETING ALL APPLICABLE STANDARD DETAILS AND SPECIFICATIONS.



**SECTION WITH SPALL ADJACENT TO JOINT**

**SECTION WITH SPALL NOT ADJACENT TO JOINT**

**NOTE:** WHEN  $X > 2"$  (50), THEN  $Y=1"$  (25) AND POLYETHYLENE FOAM IS NOT USED. WHEN  $X \leq 2"$  (50), THEN  $Y=X$  AND POLYETHYLENE FOAM IS USED.

**PARTIAL DEPTH PATCH**



**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

**P.C.C. PAVEMENT PATCHING**  
STANDARD NO. **P-2 (600)** **SHT. 5** OF **5**

**APPROVED** *Lyons, Jr. Hubert* **11/18/01**  
DATE  
**RECOMMENDED** *Michael C. ...*  
DATE

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**Appendix C**

**CIPP Lining Table**

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Cape Henlopen State Park  
CIPP Lining Table

**Project Scope: Itemized Work Locations and Details**

Segment	Street / Area	Size (in)	Average Depth (ft)	Mat'l	Protruding Lateral	CIPP Main	CIPP Lateral	Estimated Lat Length	Estimated Cos needed	CIPP Sectional	Comments	Capped Laterals	Potential Active Laterals
1-4-3 to 1-4-1	ROW	8	4.33	PVC						1	Clean and reTelevis, sectional liner may be needed.		
1-8 to 1-7	ROW	10	9.43	VCP		301	1	150	3		Dye test Nature Center to determine where is connects, if not active do not reinstate laterals		177
1-9 to 1-8	ROW	10	7	VCP		298					Dye test Nature Center to determine where is connects, if not active do not reinstate laterals		51, 221
1-10 to 1-9	ROW	8	6.28	VCP		300							
1-10-1A to 1-10-1	ROW	8	5.5	VCP		260							
1-11 to 1-10	NA	8	4.5	VCP		301							
1-12 to 1-11	NA	8	3.25	VCP		326							
1-14 to 1-13	Engineer	8	4.8	VCP		178					Do not reinstate lateral		157
1-15 to 1-14	Engineer	8	4.58	VCP		121							
Motor Pool to 1-15	Engineer	6	2.5	VCP			1	10	1		<u>LATERAL</u> : Install a cleanout at 12LF with upstream capped and 2LF section of PVC downstream, line from manhole to overlap PVC at CO		
1-16 to 1-15	Engineer	8	2.58	VCP		302	1	10	0		Lateral liner to overlap with PVC		254
1-17 to 1-16	Engineer	8	2.7	C.I.P.			1	50	1		Main C.I.P. lined previously, only one lateral was reinstated. Install lateral liner on the reinstated lateral		61, 116, 217

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Cape Henlopen State Park  
CIPP Lining Table

**Project Scope: Itemized Work Locations and Details**

Segment	Street / Area	Size (in)	Average Depth (ft)	Mat'l	Protruding Lateral	CIPP Main	CIPP Lateral	Estimated Lat Length	Estimated Cos needed	CIPP Sectional	Comments	Capped Laterals	Potential Active Laterals
1-18 to 1-17	Engineer	8	3	VCP		303					Lateral abandoned under Open Cut work		34
1-19 to 1-18	Engineer	8	4.2	VCP		252							
1-20 to 1-19	NA	6	4.65	VCP		330							
1-21 to 1-20	NA	6	3.9	VCP		240	1	25	1		Only reinstate the lateral connection made of PVC. Inspect this lateral, a lateral liner may not be required	78, 134, 138	73, 75, 155, 42(REV)
1-22 to 1-21	NA	6	4.48	VCP		304							
1-23-1 to 1-23	Campground	6	4.63	VCP		162							
1-23-1 to 1-23-2	Campground	6	7.33	PVC / VCP		118							
1-23-2 to 1-23-4	Campground	6	5.23	PVC						1	Clean roots and CCTV inspect. Sectional liner may be required		
1-23-3 to 1-23-2	Campground	6	6.3	VCP		230	2	30	2				38, 97
1-23-5 to 1-23-4	Campground	6	7.63	VCP		165					Open Cut work found lateral is inactive, and the lateral was removed		149
1-23-6 to 1-23-5	Campground	6	5.03	VCP		175							
1-23 to 1-24	Fort Miles	6	4.95	VCP		325						176	
1-24 to 1-25	Fort Miles	6	5.75	VCP		324							
1-28 to 1-27	Fort Miles	6	6.9	VCP		302					Do not reinstate laterals		195

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Cape Henlopen State Park  
CIPP Lining Table

**Project Scope: Itemized Work Locations and Details**

Segment	Street / Area	Size (in)	Average Depth (ft)	Mat'l	Protruding Lateral	CIPP Main	CIPP Lateral	Estimated Lat Length	Estimated Cos needed	CIPP Sectional	Comments	Capped Laterals	Potential Active Laterals
1-28 to 1-29	Fort Miles	6	6.68	VCP	1	252					Do not reinstate laterals		127, 150, <span style="color: red;">227</span>
1-29 to 1-29A	Fort Miles	6		VCP		150	2	50	2		Inspect main, unknown number of laterals		
1-30 to 1-31	Fort Miles	6	4.85	VCP		117					Do not reinstate laterals		0.2, 66
1-31 to 1-31B	Fort Miles	6	6.55	VCP		299							
1-31A to 1-31B	Fort Miles	6	6.05	VCP		265							
Bunker 519 to 1-31A	Fort Miles	6	6.05	VCP			1	100	2		<u>LATERAL</u> : Remove tent stake at joint outside of 1-31A, then clean and televise for rehab assessment		
2-7 to 2-6	Point RD	8	3.4	AC		663							
3-1 to 3-2-1	Officers Rd	8	5.35	VCP		142							
3-2-2 to 3-2-1	Youth Camps	6	3.5	VCP		150	1	25	1		Inspect main, unknown number of laterals		

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**Appendix D**  
**Drawing Sheets**

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- Legend**
- Pump Station
  - Existing Sewer Features**
  - Manhole - Abandoned
  - Manhole - Abandoned In Place
  - Vault - Abandoned In Place
  - Gravity Sewer Manhole
  - Gravity Sewer Vault
  - ARV Manhole
  - Sewer Line**
  - Gravity - Abandoned
  - Gravity - Abandoned In Place
  - Forcemain
  - Gravity
  - Cure-In-Place (CIPP)
  - Sectional CIPP

**NOTES:**

- Features shown are for conceptual purposes only. Refer to the pipe rehabilitation tables in specifications.
- Existing utilities are in accordance with the best available information. Buried utilities have not been field located and are not necessarily located where indicated on the plans.

Contact "Miss Utility" and also employ a professional utility locator for field location of all underground utilities.



1 inch = 300 feet

**SANITARY SEWER REHABILITATION SEWER LINING**

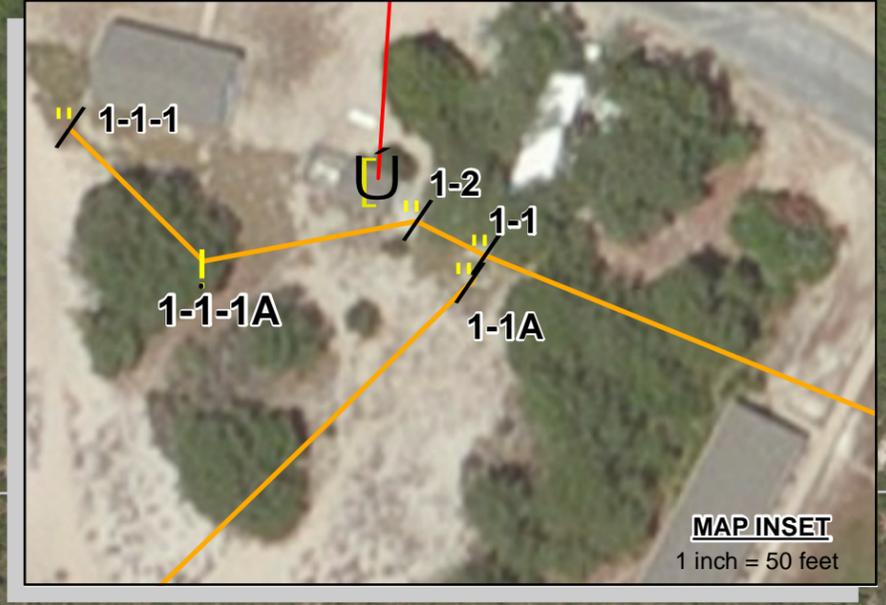
**CAPE HENLOPEN STATE PARK**

**URS**  
Iron Hill Corporate Center  
Sabre Building Suite 300  
4051 Ogletown Road  
Newark, DE 19713

DATE: DECEMBER 2013  
FILE NUMBER: 20712907  
EXHIBIT: 1 of 2

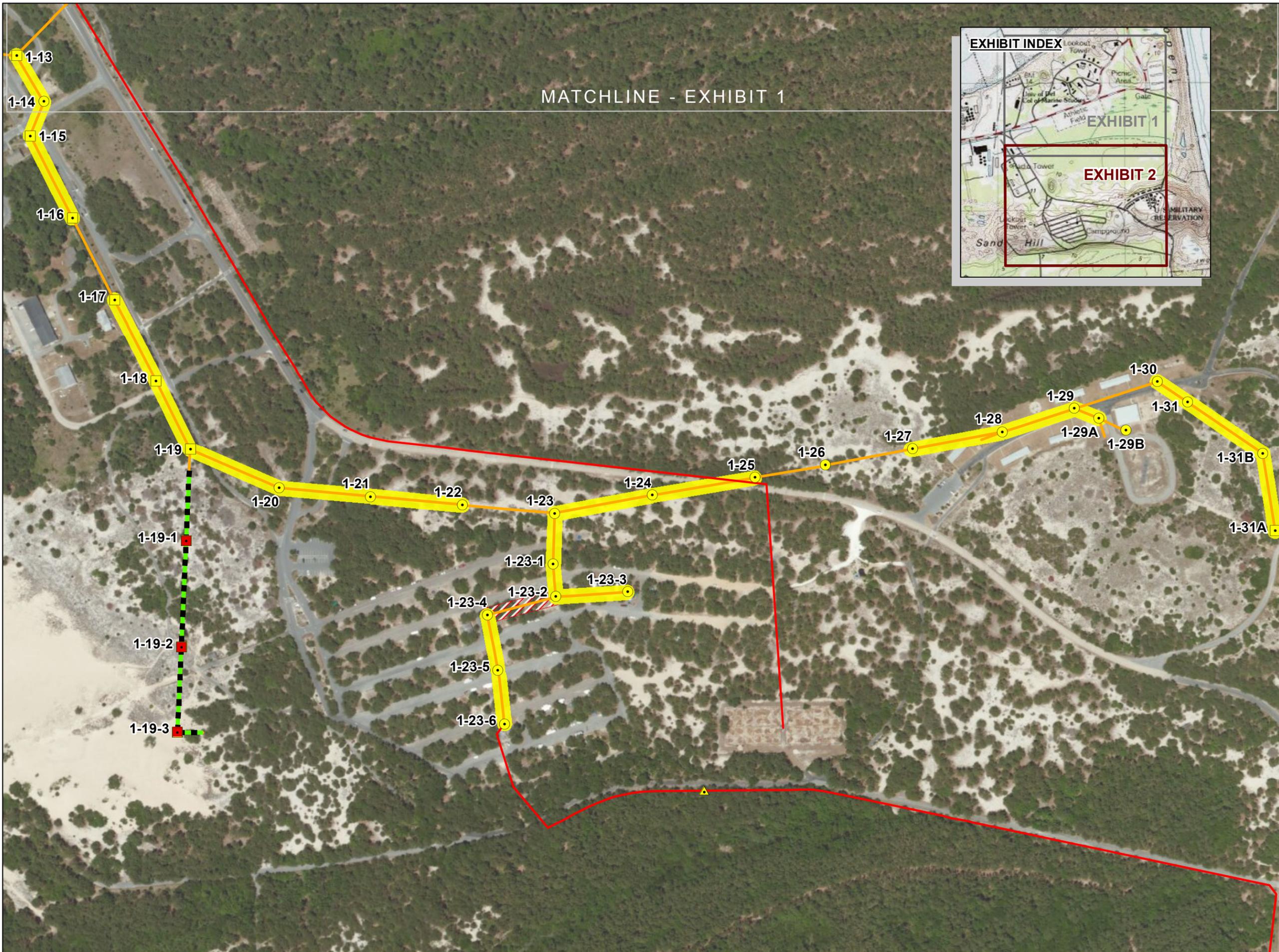


SEE MAP INSET



**MAP INSET**  
1 inch = 50 feet

MATCHLINE - EXHIBIT 2



MATCHLINE - EXHIBIT 1

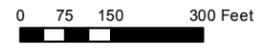


**Legend**

- PS Pump Station
- Existing Sewer Features**
- ✕ Manhole - Abandoned
- Manhole - Abandoned In Place
- Vault - Abandoned In Place
- Gravity Sewer Manhole
- Gravity Sewer Vault
- ▲ ARV Manhole
- Sewer Line**
- Gravity - Abandoned
- - - Gravity - Abandoned In Place
- Forcemain
- Gravity
- Cure-In-Place (CIPP)
- - - Sectional CIPP

**NOTES:**

1. Features shown are for conceptual purposes only. Refer to the pipe rehabilitation tables in specifications.
  2. Existing utilities are in accordance with the best available information. Buried utilities have not been field located and are not necessarily located where indicated on the plans.
- Contact "Miss Utility" and also employ a professional utility locator for field location of all underground utilities.



1 inch = 300 feet

**SANITARY SEWER REHABILITATION SEWER LINING**

CAPE HENLOPEN STATE PARK



DATE:	DECEMBER 2013
FILE NUMBER:	20712907
EXHIBIT:	2 of 2