

CITY OF ALEXANDRIA, VIRGINIA

**INVITATION TO BID (ITB) NUMBER 00000531
FOR
TAYLOR RUN EXPOSED SEWER
PROTECTION PROJECT NUMBER 11-105**

Issue Date: May 29, 2015



**Bid Opening Date, Time, and Address:
June 30, 2015, 3p.m. prevailing local time
Purchasing Division Conference Room
100 North Pitt Street, Suite 301
Alexandria, Virginia 22314**

**Issued by: Michael F. Hauer, CPPO, CPPB
Acting Purchasing Agent**

In accordance with Code of Virginia §2.2-4343.1, the City of Alexandria does not discriminate against faith based organizations in the performance of its purchasing activity.

BID SUBMISSION

Bid Due Date & Time: June 30, 2015, 3 p.m., prevailing local time

Submit Bid To: City of Alexandria
Finance Department/Purchasing Division
100 North Pitt Street, Suite 301
Alexandria, Virginia 22314
eProcure: <http://eprocare.alexandriava.gov/bsol/>

Submit: For hard copy Bids:

The Bidder shall deliver one (1) **PRINTED, SIGNED ORIGINAL** of the Bid (including all completed and signed required submittals and signed addenda), one (1) **EXACT PAPER COPY** of the **SIGNED ORIGINAL** Bid (including all completed and signed required submittals and signed addenda), and one (1) Compact Discs (CD) or Digital Versatile Discs (DVD) each containing an **EXACT COPY** of the **SIGNED ORIGINAL** Bid (including all completed and signed required submittals and signed addenda) in PDF format to the address listed above. The envelope containing the Bid shall be marked on the front with the legend **“ITB Enclosed – ITB Number 00000531, Taylor Run Exposed Sewer Protection Project Number 11-105”** and the name of the Bidder.

OR

For electronic Bids:

The Bidder shall submit the Bid (including all completed and signed required submittals and signed addenda) through the City’s eProcure system at <http://eprocare.alexandriava.gov/bsol/>.

All submissions must be received by the Bid due date and time stated above. The City will not accept any Bid received after the deadline and shall return any late Bid to the Bidder.

The City does not accept any Bid received by facsimile or electronic mail (email). Any Bid received by facsimile or email will not be considered by the City and shall be returned to the Bidder.

Notices

Effective immediately upon release of the ITB and until notice of Contract issuance, all official communications from Bidders regarding the requirements of the ITB shall be directed in writing to:

Michael F. Hauer, CPPO, CPPB
Acting Purchasing Agent
Finance Department/Purchasing Division
100 North Pitt Street, Suite 301
Alexandria, Virginia 22314
procurement@alexandriava.gov
Fax: (703) 838-6493

The City of Alexandria (City) shall distribute in writing all official changes, modifications, responses to questions, or notices relating to the requirements of the ITB via addenda, which shall be posted on eProcure. Unauthorized contact with any employee or consultant of any agency or department of the City, other than employees of the Purchasing Division, may result in disqualification from the bidding process under the ITB. Any other information of any kind from any other source or any oral communication shall be considered unofficial and non-binding on the City. A Contractor relying on unofficial information shall do so at the Contractor's own risk.

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**INVITATION TO BID (ITB) NUMBER 00000531
TAYLOR RUN EXPOSED SEWER PROTECTION PROJECT NUMBER 11-105**

Timeline

Listed below is the timeline related to the ITB. The activities with specific dates must be completed by Bidders by the time indicated. The City reserves the right to modify any timeframe or deadline in the ITB. In the event that the City finds it necessary to change any timeframe or deadline listed below or in the ITB, it will do so by posting an addendum on eProcure.

EVENTS	DATES
ITB Issuance	May 29, 2015
Deadline for Vendors to Submit Vendor Clarification Questions	June 12, 2015, 4 p.m., prevailing local time
City Issues Responses to Vendor Clarification Questions via Addendum	June 19, 2015
Bid Due Date and Time	June 30, 2015, 3 p.m., prevailing local time
Bid Award Date	TBD

PART I – SCOPE OF WORK

1.1 INTRODUCTION/OVERVIEW

The City of Alexandria, Virginia is an urban community of 15.03 square miles with a population of approximately 149,000. With its stable residential neighborhoods, its historic districts, and its proximity to Washington, D.C., the City continues to attract new residents, tourists, and businesses.

1.2 DEFINITIONS

Please see Section 3.1 for definitions of capitalized terms.

1.3 PURPOSE/OBJECTIVE

The City has issued the ITB in order to obtain Bids from qualified Bidders and enter into a Contract for the provision of construction services for the Taylor Run Exposed Sewer Protection Project Number 11-105 for the City's Department of Project Implementation (DPI).

1.4 SCOPE OF WORK

The successful Bidder shall provide all goods, services, labor, and insurance necessary to meet or exceed the requirements and specifications contained herein and the Technical Specifications and Drawings included as separate PDF downloads.

As further detailed in the technical documentation, including plans and specifications, the City is seeking services for the rehabilitation of sanitary sewer manholes.

These documents describe the Work to replace an exposed eighteen inch (18") CIPP lined concrete pipe. The scope of Work includes the existing sanitary sewer to be removed, and replaced with eighteen inch (18") ductile iron pipe as well as installing a new manhole and vinyl seawall. In addition, the Work includes maintenance of traffic and maintenance of sanitary sewer flows.

All construction activities shall comply with the Alexandria Noise Control Code Title 11, Chapter 5, which permits construction activities to occur between Monday through Friday, 7 a.m. to 6 p.m. and Saturdays 9 a.m. to 6 p.m. No construction activities are permitted on Sundays.

1.5 CONTRACTOR'S RESPONSIBILITIES UNDER A CONTRACT

- A.** Mobilization and demobilization charges or similar charges for each site shall be limited to an amount calculated in accordance with 2007 VDOT Road and Bridge Specifications Section 513.02
- B.** The Contractor shall furnish, through its workforce or sub-workforce, all necessary and appropriate bonds, insurance, supervision, coordination, labor, tools, equipment, machinery, materials, supplies, transportation, relevant license or patent rights, and other goods and services necessary to fulfill the Contract requirements.
- C.** The Contractor shall plan, schedule, and provide services in such a way as to conform to the operational needs of the City in order to avoid disruption of work and other undesirable or unacceptable consequences
- D.** The Contractor shall maintain clear and open communication with the City. The Contractor shall promptly respond to any and all City inquiries.
- E.** The Contractor shall work with the City to avoid problems or, when that is not possible, to resolve problems promptly and at the lowest possible level.
- F.** The Contractor shall create project records of expenditures, deliverables, and progress.
- G.** Complete the Work within ninety (90) Calendar Days of the "Notice to Proceed".

1.6 CITY'S RESPONSIBILITIES UNDER A CONTRACT

- A.** The City shall provide access to City-owned or City-controlled facilities for the Contractor's employees and agents, as necessary for them to perform the Work.
- B.** The City will render decisions pertaining to information submitted by the Contractor within a reasonable time as determined by the City.
- C.** The City will work with the Contractor to reduce the risk of changes, claims, and extra costs.
- D.** The City will submit payments to the Contractor in the timeframes prescribed by Alexandria City Code §3-3-56.
- E.** The City will assign a Contracting Officer's Technical Representative (COTR), who will serve as a technical representative for Contract administration.

1.7 CONTEMPLATED TERM OF ANY CONTRACT ISSUED

If an award is made pursuant to the ITB, the City will issue a Contract for an initial period of ninety (90) Calendar Days, unless extension is deemed required by the City.

PART II - BID INSTRUCTIONS AND PROCESS

2.1 SUBMISSION; DELIVERY METHODS; DELIVERY INSTRUCTIONS

- A. Submission:** Sealed Bids must be received by the City by **3 p.m., prevailing local time, June 30, 2015**. Delivery must be made pursuant to the instructions set forth on page two (2), entitled Bid Submission, of the ITB. All Bids must be physically received by the Purchasing Division, or submitted in eProcure, prior to the submission deadline above. The City will not accept any Bid received after the deadline and shall return any late Bid to the Bidder.
- B. Delivery Methods:** The City encourages Bidders to submit Bids through the City's eProcure system at <http://eprocure.alexandriava.gov/bso/>. Bidders also may submit a Bid to the City by mail, common carrier, or hand-delivery. The City will not accept any Bid submitted by facsimile or by electronic mail and will return any Bid received through facsimile or by electronic mail.
- C. Delivery Instructions:** Bids submitted shall be submitted pursuant to the instructions on page two (2), entitled Bid Submission, of the ITB.

2.2 GENERAL INQUIRIES RELATED TO THE CITY'S PURCHASING PROCESS

For general questions related to the City's purchasing process, vendors may contact the City's Purchasing Division at 703.746.4944 or send an email to procurement@alexandriava.gov. For detailed information about the City's purchasing process, vendors may see "How to Do Business with the City of Alexandria, Virginia - A Guide for Vendors" available on the City's website at alexandriava.gov/2064.

2.3 SPECIFIC INQUIRIES AND DEADLINE

- A.** It is the Bidder's responsibility to submit questions regarding the ITB to the Purchasing Division. In order to receive a written response from the City, all questions regarding the ITB must be submitted in writing and received by the City by **4 p.m., prevailing local time, June 12, 2015**. Questions shall be: (1) emailed to the attention of Michael F. Hauer at procurement@alexandriava.gov; (2) faxed to 703.838.6493; or (3) mailed or delivered to City of Alexandria Purchasing Division, 100 North Pitt Street, Suite 301, Alexandria, Virginia 22314. Any submission of questions related to the ITB shall include the reference "**ITB # 00000513, Taylor Run Exposed Sewer Protection Project Number 11-105**" and the name of the person submitting the question(s).

- B. Bidders are advised that oral explanations or instructions given by City personnel during the bidding process or at any time before the issuance of a Contract are not binding on the City. After issuing the ITB, the only information binding on the City is information that is conveyed through a written addendum to the ITB. Written addenda will be issued when additional information is deemed necessary and when the lack of such information may be prejudicial to uninformed prospective Bidders. All addenda must be signed by Bidders and returned with their Bids.
- C. Any revisions to the ITB shall be made only by addenda issued by the Purchasing Agent. All addenda to the ITB shall be available on the City's website at <http://eprocure.alexandriava.gov/bs/>.

2.4 COMPLIANCE WITH THE ITB

- A. It is the responsibility of each Bidder to thoroughly examine the documents and other related data identified in the ITB before submitting a Bid in response to the ITB.
- B. A Bidder shall ensure that its Bid complies with all the requirements of the ITB. Any Bid that is not in strict compliance with all provisions of the ITB may be deemed non-responsive and disqualified.

2.5 WAIVER OF INFORMALITIES

The City reserves the right to waive informalities. The Purchasing Agent shall have the sole discretion and judgment to determine if a Bid is responsive and whether an error in or an omission of any ITB requirement from a Bid is material.

2.6 EXAMINATION OF DOCUMENTS

If a Bidder discovers any ambiguity, conflict, discrepancy, omission, or other error in the documents, it shall immediately notify the Purchasing Division of such in writing and request modification or clarification. Any Bid that includes assumed clarifications and/or corrections is subject to rejection by the City. Any necessary modification or clarification will be made by the Purchasing Agent by a written addendum.

2.7 PROCEDURES FOR SUBMITTING A BID

- A. The Bidder shall review and comply with the requirements of the ITB and ensure that all required information is provided and required forms are executed and returned with its Bid.

- B. A Bid shall contain the original signature of an individual who is authorized to bind the Bidder. The original signature shall be provided on the Offer and Award Form (Required Submittal A) and on all other Bid documents where a signature is required. Facsimile signatures, photographic reproductions of signatures, rubber stamps, etc., are not acceptable, except in cases where the Bidder submits its Bid through the City's eProcure system.

2.8 BID AND PRESENTATION COSTS

The City shall not be liable in any way for any costs incurred by any Bidder in the preparation or presentation of its Bid or its participation in any discussion, presentation, negotiation, or meeting regarding its Bid or the ITB.

2.9 BIDDER OBLIGATION

- A. Prior to submitting a Bid, a Bidder shall make all investigations and examinations necessary to verify any representations made by the City and to ascertain all conditions and requirements affecting the full performance of the Contract. The Bidder is responsible for reading, researching, and understanding all documents that can affect the Work to be performed under the Contract.
- B. The Bidder's signature on the Offer and Award Form (Required Submittal A) certifies its acceptance of all conditions and requirements. Ignorance of any conditions or requirements resulting from failure to make or making inadequate investigations and examinations will not relieve the successful Bidder from its obligation to comply with all provisions and requirements of the Contract. Ignorance shall not be accepted as a basis for any claim on the part of the successful Bidder.

2.10 CONDITIONAL BIDS

Bidders are cautioned not to take exception to the ITB requirements. Taking exception to the ITB requirements may result in a conditional Bid. A conditional Bid may be rejected in whole or in part.

2.11 COMPLETE PRICING REQUIRED

A unit price shall be stated on the Bidder's Pricing Schedule (Required Submittal G) for each separate bid item described therein. In addition, the extended total shall be stated for each item. In the event of an error in the extended total of the individual items, the unit prices shall govern. It is the Bidder's responsibility to provide pricing for all the Work required in the ITB. A Bidder may not submit Bid pricing changes or additions after Bid submission. Labor pricing shall be at the fully burdened labor rate (e.g. including all payroll taxes, health insurance, overhead, etc.).

2.12 BID OPENING

The City encourages Bidders to attend Bid openings. During Bid openings, the following information for each Bid is read publicly and recorded: the Bidder's name, the unit price(s), and the total Bid price.

2.13 RESPONSIBILITY

- A.** A Bidder has the burden of affirmatively demonstrating its responsibility in connection with the ITB.
- B.** The Purchasing Agent may request at any time that a Bidder provide information, references, and other documentation or information relating to a determination of responsibility. A Bidder's failure to furnish the required information may constitute grounds for a finding of the Bidder's non-responsiveness and/or non-responsibility.
- C.** The following criteria and any other deemed appropriate by the City may be considered in determining a Bidder's responsibility:
 - 1.** The Bidder's ability, experience, capacity, skill, facilities, and financial resources to perform the Work and fulfill the requirements of a resulting Contract;
 - 2.** Whether the Bidder is in default under any other contract;
 - 3.** The Bidder's ability to perform the Work under the Contract and produce the required performance outcomes on a timely basis;
 - 4.** The Bidder's performance on contracts similar in size and scope to the Work sought through the ITB;
 - 5.** Whether the Bidder is properly licensed under applicable federal, state, and local law or provides proof that an application(s) has been submitted to obtain the requisite license(s); and
 - 6.** The Bidder's demonstrated accurate and complete knowledge and understanding of all federal, state, and local law, codes, and regulations relating or applicable to the scope of Work set forth in the ITB.
- D.** A Bidder currently debarred by any public body shall be considered non-responsible. Additionally, a Bidder may be considered non-responsible if the Bidder previously failed to properly perform or complete, in a timely manner, contracts of a similar nature or if investigation shows that the Bidder is unable to perform the requirements of the ITB or for any other similar reason.

- E.** References may be checked for each Bidder. If references are checked, Bidders will be scored on a scale of one to ten (1-10) with ten (10) being the highest possible score. Any Bidder receiving an overall score of less than six (6) may not be eligible for award. The scores may be used in determining a Bidder's responsibility and eligibility for award pursuant to the ITB.
- F.** The City may ask a reference any or all of the following questions and any other question the City deems appropriate:
1. How cooperative and easy to work with was the Bidder during the purchasing process?
 2. How promptly, effectively, and efficiently did the Bidder mitigate or resolve performance or contractual issues that arose during the contract or project?
 3. How would you rate the Bidder's operational and administrative practices (e.g., the timeliness, completeness, and accuracy of its invoices)?
 4. How would you evaluate the number and validity of Bidder-generated change order (contract modification) requests, claims, disputes, and lawsuits, if any?
 5. How would you rate the timeliness, quality, responsiveness, and usefulness of the Bidder's goods, services, and/or work products in relation to your requirements?
 6. How would you assess the timeliness, quality, responsiveness, and usefulness of the Bidder's services and work products in relation to how much you paid the Bidder and how much time your organization contributed in time and effort to the project?
 7. How well did the Bidder minimize the effect of its activities on the operations of your organization?
 8. How satisfied were you with the Bidder's point of contact?
 9. How promptly and effectively did the Bidder address your questions or concerns?
 10. Would you utilize this firm again in the future?
- G.** The Bidder shall submit list of references on the Reference List Form (Required Submittal H.).

2.14 WITHDRAWAL OF BID

- A.** A Bidder may withdraw its Bid from consideration at any time prior to the Bid opening by notifying the Purchasing Agent in writing of such withdrawal.

- B.** Subsequent to the commencement of the Bid opening procedure, a Bidder may withdraw its Bid from consideration if the price bid was substantially lower than other Bids due solely to a mistake therein, provided: (i) that the Bid was submitted in good faith; (ii) that the mistake was a clerical mistake as opposed to a mistake in judgment and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor, or material made directly in the compilation of the Bid; and (iii) that the unintentional nature of the arithmetic error or omission is clearly shown to the Purchasing Agent's satisfaction by objective evidence drawn from original work papers, documents, and materials used in the preparation of the Bid sought to be withdrawn.
- C.** Subsequent to the commencement of the Bid opening procedure, if a Bid contains both clerical and judgment mistakes, a Bidder may withdraw its Bid from consideration if the price bid would have been substantially lower than the other Bids due solely to the clerical mistake, which was an unintentional arithmetic error or an unintentional omission of a quantity of work, labor, or material made directly in the compilation of a Bid, which shall be clearly shown by objective evidence drawn from inspection of original work papers, documents, and materials used in the preparation of the Bid sought to be withdrawn.
- D.** The Bidder shall give Notice in writing of his claim of right to withdraw within two (2) Business Days of the conclusion of the Bid opening procedure and shall submit original work papers, documents, and materials with such Notice. The Bidder shall submit the Notice and documents to the Purchasing Agent.

2.15 TIE BIDS

In the case of a tie bid, preference shall be given to goods that are produced in Virginia or goods, services, or construction that is provided by Virginia persons, firms, or corporations. Whenever any Bidder is a resident of any other state and such state under its laws allows a resident contractor of that state a preference, a like preference may be allowed to the lowest responsible Bidder who is a resident of Virginia. If all Bids received are for the same total amount or unit price, quality and service being equal, the Contract shall be issued to a local Bidder. The City, at its option, may also request the Bidders to submit written Bids below their original Bids and make an award to the Bidder with the lowest bid price. In the event that none of the foregoing provisions resolve the tie, the Purchasing Agent may cancel the solicitation and re-issue the invitation to bid.

2.16 BID AWARD

- A.** The City is using the competitive sealed bid method of source selection for this purchase, as authorized by the Alexandria City Code. If an award(s) is made, the City will issue a Contract(s) to the lowest responsive and responsible Bidder(s) that complies with all provisions of the ITB, provided the bid price is reasonable and it is in the City's best interests to accept it.

The City reserves the right to make partial awards, multiple awards, or an aggregate award or to reject any or all Bids in response to the ITB or subsequent Task Orders.

- B.** The Purchasing Agent also reserves the right to reject any and all Bids received in response to the ITB or any and all Bids received in response to any Task Order(s) issued to a Contractor(s).
- C.** No Contract shall be issued by the City until the two (2) Business Day period of time has elapsed and no notice of Bid withdrawal has been received. If a timely notice of Bid withdrawal is received from the apparent low Bidder, no Contract shall be issued until the Purchasing Agent has determined whether to allow the withdrawal of the Bid.

2.17 ACCEPTANCE OF BID AND CONTRACT ISSUANCE

- A.** The Purchasing Agent's execution of a Bidder's Offer and Award Form (Required Submittal A) constitutes acceptance of the Bid, and the acceptance shall bind the Bidder to the Contract.
- B.** A Notice of Award shall be issued to the successful Bidder.
- C.** A Notice of Non-Award shall be issued to the unsuccessful Bidder(s) and shall identify the successful Bidder and the total price at which the Contract(s) was issued.
- D.** The Contract executed by the parties shall set forth the Contract documents, including an order of precedence.
- E.** The City's Purchase Order shall serve as a payment document. The Purchase Order number shall be shown on all invoices and correspondence pertaining to the Contract. No Work shall begin prior to the issuance of a Purchase Order and Notice to Proceed, if required.

2.18 ACKNOWLEDGMENT OF INSURANCE REQUIREMENTS

- A.** The Bidder, by signing and including the City of Alexandria Insurance Checklist Form (Required Submittal C), acknowledges that it has read and understands the insurance requirements for the ITB contained in the Insurance Checklist Form (Required Submittal C) and Section 3.14. The Bidder also acknowledges that evidence of required insurance coverage must be submitted within ten (10) Business Days following issuance of a Notice of Award and that the City may rescind its acceptance of the Bidder's Bid upon the Bidder's failure to timely provide the evidence of insurance.

- B. The specific insurance policies required by the Insurance Checklist Form (Required Submittal C) shall include the terms and provisions and be written for no less than the limits of liability (or greater limits if required by law or contract) as shown on the Insurance Checklist Form (Required Submittal C).
- C. If a Bidder does not meet the insurance requirements of the ITB, alternate insurance coverage satisfactory to the City's Purchasing Agent may be considered. Written requests for consideration of alternate coverage shall be received by the City's Purchasing Agent at least ten (10) working days prior to the date set for opening Bids. If the City denies the request for alternate coverage, the specified coverage must be submitted. If the City permits alternate coverage, an amendment to the insurance requirements will be prepared and distributed via addendum prior to the time and date set for Bid opening.
- D. The City may consider deductible amounts as part of its review of the Bidder's financial responsibility and capacity.

2.19 BID BONDS

- A. Except in cases of emergency, all Bids for non-transportation-related construction contracts in excess of five hundred thousand dollars (\$500,000) or transportation-related projects authorized under Code of Virginia §33.1-12 that are in excess of two hundred fifty thousand dollars (\$250,000) and partially or wholly funded by the Commonwealth of Virginia, shall be accompanied by a bid bond in the amount of five percent (5%) of the Bidder's proposed Contract price.
- B. The bid bond shall be in the form and amount satisfactory to the Purchasing Agent.
- C. The bid bond shall be payable to the City of Alexandria.
- D. Each of the bonds shall be filed with the City of Alexandria or a designated office or official thereof.

2.20 PERFORMANCE AND PAYMENT BONDS

- A. Upon the award of any: (i) public construction contract exceeding five hundred thousand dollars (\$500,000) issued to any prime contractor; (ii) construction contract exceeding five hundred thousand dollars (\$500,000) issued to any contractor requiring the performance of labor or the furnishing of materials for buildings, structures, or other improvements to real property owned or leased by the City; (iii) construction contract exceeding five hundred thousand dollars (\$500,000) in which the performance of labor or the furnishing of materials shall be paid with City funds; or (iv) transportation-related projects exceeding two hundred fifty thousand dollars (\$250,000) that are partially or wholly funded by the Commonwealth of Virginia, the Contractor shall furnish to the City the following bonds:

1. A performance bond in the sum of the Contract amount conditioned upon the faithful performance of the Contract in strict conformity with the plans, specifications, and conditions of the Contract; and
 2. A payment bond in the sum of the Contract amount. The bond shall be for the protection of claimants who have and fulfill contracts to supply labor or materials to the prime Contractor to whom the Contract was issued or to any subcontractors in the furtherance of the Work, and shall be conditioned upon the prompt payment for all materials furnished or labor supplied or performed in the furtherance of the Work.
- B.** Each of the bonds shall be executed by one or more surety companies selected by the Contractor that are authorized to do business in Virginia.
- C.** Bonds shall be in the form and amount satisfactory to the Purchasing Agent.
- D.** Bonds required for City contracts shall be payable to the City of Alexandria.
- E.** Each of the bonds required under this section shall be filed with the Purchasing Division.
- F.** At its discretion, the City may require performance and/or payment bonds for contracts other than those set forth in subsection A.
- G.** Nothing in this section shall preclude the Contractor from requiring each subcontractor to furnish a payment bond with surety thereon in the sum of the full amount of the contract with such subcontractor conditioned upon the payment to all persons who have and fulfill contracts that are directly with the subcontractor for performing labor and furnishing materials in the prosecution of the work provided for in the subcontract.

2.21 ALTERNATIVE FORMS OF SECURITY

Alternative forms of security may be acceptable when approved pursuant to the provisions of Alexandria City Code §3-3-55. If a certified or cashier's check is offered in lieu of a bond, it shall be made payable to the order of "City of Alexandria." If an alternative form of security is approved, it must be provided in accordance with the particular bond types set forth herein.

2.22 RETURN OF BID SECURITIES

All bid bonds, certified checks, or other approved Bid security will be returned to Bidders except for those that the City elects to hold until the successful Bidder has executed the Contract.

Thereafter, all such Bid securities, except those of the successful Bidder, will be returned. The successful Bidder may be required to furnish a performance bond and/or a payment bond in an amount equal to one hundred percent (100%) of the Contract Sum.

2.23 REQUESTS FOR CLARIFICATION OF BIDS BY THE CITY

Requests by the City for clarification of Bids shall be in writing and for the purpose of obtaining any information necessary for the City to fairly evaluate a Bidder's Bid.

2.24 VALIDITY OF BIDS SUBMITTED IN RESPONSE TO ITB

A Bid submitted in response to the ITB shall remain valid for a minimum of one hundred twenty (120) Calendar Days following the due date of the ITB.

2.25 ACCESS TO PURCHASING INFORMATION

Alexandria City Code §3-3-33 sets forth information about public access to purchasing information.

2.26 PROTESTS AND APPEALS

Information regarding protests and appeals is provided in Article G, Chapter 3, Title 3 of the Alexandria City Code.

2.27 USE OF CONTRACT BY OTHER PUBLIC BODIES

A. Bidders are advised that any Contract resulting from the ITB may be extended, with the Contractor's authorization, to another public body to permit its use of the Contract at the same prices and/or discounts and terms and conditions of the Contract.

If the Contractor authorizes another public body to use a Contract resulting from the ITB, the Contractor will deal directly with that public body concerning all matters regarding the Contract, including, but not limited to, the placement of orders, issuance of purchase orders, contractual disputes, invoicing, and payment. A Contractor may withdraw its authorization to extend its Contract to a public body. Any Bidder's refusal to extend a Contract to a public body shall not affect the evaluation of Bids submitted in response to the ITB.

B. It is the Contractor's responsibility to notify other public bodies of the availability of the Contract. The City shall not be held liable for any costs or damages incurred by a public body or Contractor as a result of any Contract being extended or not extended to that public body by the Contractor.

PART 3

GENERAL TERMS AND CONDITIONS FOR CONSTRUCTION

3.1 DEFINITIONS

Acceptance means, in terms of goods, the COTR's approval of the Contractor's invoice for such goods after a reasonable opportunity to inspect and, in terms of services, the COTR's approval of the Contractor's invoice for such services.

Architect means an individual licensed, or an organization legally authorized, to practice architecture in the Commonwealth of Virginia, or the authorized representative of the licensed individual or organization.

Bid means a Bidder's offer to provide specific goods and/or services at specified prices and per the conditions set forth in the ITB.

Bidder means any person who submits a Bid in response to the ITB offering to enter into a Contract with the City.

Business Day means any day other than a Saturday, Sunday, City holiday, or other day on which the City is closed.

Calendar Day means any day in a year, from midnight to midnight, including weekends and holidays.

Change Order means a written order to the Contractor, signed by the City, which authorizes a change in the Work, an adjustment to the Contract Sum, and/or an adjustment to the Contract Period.

City means the City of Alexandria, a municipal corporation of Virginia, and its authorized representatives and employees.

Contract means a mutually binding and legally enforceable agreement executed between the City and a Contractor after an award pursuant to the ITB that obligates the Contractor to furnish construction to or on behalf of the City and the City to pay for the construction. The Contract shall consist of, but is not limited to, the following:

- A. The ITB;
- B. All addenda issued related to the ITB;
- C. The Bidder's signed Bid and all other documents submitted by the Bidder to the City in response to the ITB;
- D. The Notice of Award issued for the ITB;
- E. The Notice to Proceed;
- F. These General Terms and Conditions;
- G. The Schedule(s);
- H. All testing documentation;
- I. The Task Order(s), if applicable, issued for the ITB;

- J. If applicable, the Bidder's signed response to the Task Order and all other documents submitted by the Bidder to the City in response to the Task Order issued for the ITB;
- K. The Purchase Order(s) issued for the ITB;
- L. Any related Agreements (e.g. Warranty, Support and Maintenance Agreements); and
- M. All Change Order(s) issued pursuant to the Contract.

Contract Period means the period allotted in the Contract Documents for Substantial Completion of the Work, together with any Time Extensions granted in accordance with the terms of this Contract.

Contract Specialist means a City employee or representative whose responsibilities include issuing bids, solicitations or other contractual documents, and drafting, analyzing, and negotiating contracts under the direction and supervision of the City's Purchasing Agent.

Contract Sum means the total amount payable to the Contractor for performance of the Work. The Contract Sum is stated in the Contract and shall include any adjustments granted by Change Order.

Contracting Officer's Technical Representative (COTR) means the City employee who serves as the Purchasing Agent's technical representative for the purposes of administering the Contract. The COTR may designate one or more additional representatives to assist with contract administration.

Contractor means the individual, firm or organization which contracts with the City to perform the Work. As employed herein, the term "Contractor" may refer to an individual, an organization, or to the Contractor's authorized representative.

Construction means building, altering, repairing, improving, or demolishing any structure, building or highway, and any draining, dredging, excavating, grading or similar work on real property.

Final Completion means, as defined in Section 3.13D, the certification by the Architect that all work has been accepted and is complete in accordance with the Contract Documents. Unless otherwise agreed, Final Completion shall occur within thirty (30) calendar days of the date of Substantial Completion.

Final Payment means the payment of the balance of the Contract Sum, following the Acceptance of all goods and/or services delivered pursuant to the Contract

Liquidated Damages means a specific sum to be paid for each day that the time consumed in substantially completing the work exceeds the contract period (See Section 3.8B).

Notice is defined in Section 3.25.

Notice to Proceed means a written notice from the City to the Contractor directing the Contractor to proceed with the Work.

Project means the entire improvement of which this Contract forms a part and which may include construction by the City or by separate contractors.

Purchasing Agent means the City's principal public purchasing official responsible for the purchase of all goods, services, insurance, and construction needed by the City, or his designated representative.

Specifications means an explicit set of requirements to be satisfied by construction, a material, product, or service as contained in the Invitation to Bid.

Subcontractor means any individual, firm or organization, other than an employee of the Contractor, who contracts with the Contractor to furnish or who actually furnishes labor, materials, services or equipment, or any combination thereof to the Contractor in connection with the Work.

Substantial Completion means, as defined in Section 3.13D, certification by the Architect that the Work has been sufficiently completed, in accordance with the Contract Documents, to allow the Work to be utilized for the purpose for which it was intended.

Surety means any person, firm or corporation that has executed as surety the Contractor's performance or payment bonds securing performance of this Contract or providing for protection of claimants who have and fulfill contracts to supply labor or materials to the Contractor or Subcontractor in connection with the Work.

Time Extension means, as set forth in Section 3.8D, a written Notice, signed by the Purchasing Agent, extending the Contract Period.

Time(s) for Performance means the date(s) and time(s) by which goods are required to be delivered and/or services are required to be provided, in accordance with the Contract.

Work means the construction required under the Contract.

3.2 EXECUTION AND INTENT OF THE CONTRACT

Execution of the Contract: Execution of the Contract by the Contractor constitutes a representation by the Contractor that it has visited the site, become familiar with local conditions under which the Work is to be performed, and correlated personal observations with the requirements of the Contract Documents.

Intent of the Contract Documents: The Contract shall include all items necessary for the proper execution and completion of the Work, including without limitation, all labor, materials, equipment and furnishings required to complete the Work.

Subdivision of Drawings and Specifications: The subdivision of the any drawings and Specifications into divisions, sections, and articles is for ease of reference only and shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. The Contractor shall be solely responsible for dividing the Work among the various trades.

Intent of Specifications: The mention in any section of the Specifications of any article or operation requires that the Contractor shall provide all such items indicated on, or reasonably inferred from, the Drawings, furnishing for such purpose all labor, materials and equipment required in connection therewith. Omission of any article or operation does not relieve the Contractor of the responsibility for completion of the Work intended by the Drawings and Specifications to be included in the Contract.

Substitutions: Unless otherwise indicated, all brand, make, or manufacturer references in the Specifications and Drawings are intended to define a general style, type, character, and quality of the article desired. Substitution may be used with the written approval of the City after the Contractor has demonstrated to the satisfaction of the City, in its sole discretion, that the substituted item is equivalent to that specified, considering quality, workmanship, economy of operation and suitability for the purpose intended. Individual item approvals do not relieve the Contractor of the responsibility to provide a total system that performs in a manner and of a quality intended by the original design.

Contract Interpretations by Architect: The City or the Contractor may request contract interpretations in writing from the Architect. Such requests for interpretations must be submitted sufficiently in advance of the date upon which the interpretation is actually required by the City or the Contractor to allow the Architect to issue the interpretation so as not to delay the Work. Written interpretations so requested shall be issued by the Architect in a manner commensurate with the timely execution of the Work, consistent with the intent of the Contract, and in accordance with established schedules.

3.3 THE CITY

Authority of the Purchasing Agent: The Purchasing Agent shall be the contracting officer for the City and is authorized to execute this Contract and any Change Orders issued pursuant to Section 3.9. No Notice to the City shall be effective unless a copy is delivered to the Purchasing Agent in accordance with the terms of the Contract.

Authority of the COTR: Except as provided in Section 3.1, the Contract shall be administered by the Director of the Department of Project Implementation, or his/her designated representative, who shall be referred to in the Contract Documents as “the Contracting Officer’s Technical Representative (COTR).” In administering the Contract, the COTR will be assisted by the Architect, who will review submittals, conduct inspections and perform other duties as directed by the COTR. The Contractor shall communicate with the Architect through the COTR.

Additional City Representatives: The COTR may designate one or more additional representatives to observe the Work, provided, however, that the presence of these or any other City representatives shall in no way constitute an approval of means, methods or materials which do not conform to the requirements of the Contract Documents.

Right to Reject Work: The COTR shall have the right to reject Work in accordance with Section 3.4D.

Right to Approve Payments: The COTR shall have the right to review, revise, and approve the Architect's certifications concerning payment.

3.4 THE ARCHITECT

Duties of the Architect: The Architect shall advise the City, act at the direction of the COTR, and perform such other duties and responsibilities as are assigned to him by the Contract.

Architect's Access to the Work: The Architect shall have access to the Work and shall visit the site periodically in order to determine the progress and to assess the quality of the completed Work. Based upon his on-site evaluations, the Architect will advise the City of the progress of the Work and will endeavor to guard the City against defects and deficiencies in the Work. The Architect shall not have control over or charge of and shall not be responsible for construction methods, techniques, procedures, sequences or safety measures employed in connection with the Work. The Architect shall not be responsible for the failure of the Contractor, subcontractors, or sub-subcontractors to perform the Work in accordance with the Contract.

Architect to Certify Applications for Payment: Based upon the Architect's observations and evaluations of the Contractor's Applications for Payment, the Architect shall review and certify the amounts due the Contractor.

Architect's Right to Reject Work: The Architect and/or the COTR shall have the authority to reject Work that does not conform to the requirements of the Contract Documents. The Architect and/or the COTR shall have the authority to order special inspections or tests, regardless of whether or not the Work has been fabricated, installed or completed.

Other Duties of the Architect: The Architect shall work with the COTR to develop any Change Orders and change order requests, shall perform inspections to determine the Dates of Substantial and Final Completion, shall review all required documents submitted by the Contractor, and shall issue Certificates of Substantial Completion and Final Payment in accordance with the provisions of Section 3.13D.

No Contract Between Contractor and Architect: No contractual relationship exists between the Architect and the Contractor.

3.5 CONTRACTOR

Duties of the Contractor: The Contractor shall perform all the Work and shall furnish, at its own cost and expense, all labor, materials, equipment, and other facilities, except as herein otherwise provided, as may be necessary and proper for the performance and completion of the Work. The Contractor shall be responsible for the entire Work until completed and finally accepted by the City.

Supervision and Construction Procedures: The Contractor shall supervise and direct the Work and coordinate the Work with that of separate contractors, using its best skill and attention. Unless otherwise expressly provided, 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 otherwise expressly provided, the means and methods of construction shall be such as the Contractor may choose, provided, however, that the Contractor shall employ adequate and safe procedures, methods, structures and equipment. Neither the Architect's approval nor his/her failure to exercise his/her right of approval shall relieve the Contractor of his/her obligation to accomplish the result intended by the Contract, nor shall the Architect's approval or failure to approve create a cause of action for damages.

Review of Contract Documents: The Contractor shall study and review the Contract Documents and shall compare them with each other and with such information made available by the City. The Contractor shall advise the Architect and the COTR of any errors, inconsistencies or omissions discovered by him/her. The Contractor shall not be liable to the City or the Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, unless the Contractor recognized such error, inconsistency or omission and failed to report it to the Architect and to the COTR.

Qualifications of Contractor: The Contractor represents that it is a duly organized and licensed entity which employs qualified and experienced personnel who specialize in performing the type of construction services required hereunder. The Contractor agrees to provide a sufficient number of personnel who are suitably qualified and experienced and who are in all respects acceptable to the City to perform the Work in an efficient and timely manner. The Contractor represents that it is capable in all respects (including the possession of sufficient financial resources to provide fully for the payment of employees) of performing the Work and agrees to provide construction services of high quality. The Contractor agrees to diligently and conscientiously devote its resources to the performance of the Work. The City, upon written notice to the Contractor, and in the City's sole discretion, shall have the right to direct the Contractor to remove an employee permanently from the site for any reason.

Responsibility for Those Performing the Work: The Contractor shall be responsible and accountable to the City for the acts and omissions of its employees in connection with the performance of the Work and for any Subcontractors or other persons performing any of the Work under a contract with the Contractor or a contract with a Subcontractor.

Permits and Licenses: The Contractor shall obtain all permits, licenses, and inspections necessary to properly execute the Work specified in the Contract. The fees for City required permits will be waived. The Contractor shall give all notices and comply with all laws, ordinances, rules, and lawful orders. If the Contractor observes that any portion of the Contract is at variance with applicable laws, statutes, and building codes, the Contractor shall promptly notify the City in writing and necessary changes will be accomplished by modification.

Compliance with Laws: The Contractor shall be responsible for giving all notices and complying with all laws, ordinances, rules, regulations and directives of any public authority bearing on the performance of the Work. Should the Contractor determine that the Contract Documents, or any of them, do not conform to such laws, ordinances, rules, regulations and directives in any respect, the Contractor shall promptly inform the Architect and the COTR of such fact in writing. If the Contractor performs any Work knowing it to be in conflict with such laws, ordinances, rules and regulations without notification to the Architect and City, the Contractor shall accept all responsibility and bear all costs relating thereto.

Drawings and Specifications at the Site: The Contractor shall maintain one copy of all Drawings, Specifications, Addenda, approved Shop Drawings and Change Orders at the site of the Project. All of the documents are to be kept in good order and marked to record all changes made during construction. The documents shall be made available to the City and Architect during performance of the Work. Upon completion of the Work, the Drawings, together with all changes and revisions made during construction of the Project, shall be delivered to the Architect.

Shop Drawings and Submittals: Contractor shall review, approve, and timely submit all shop drawings, product data and samples required by the Contract in such sequence as to cause no delay in the Work. By submitting shop drawings, product data, and samples, the Contractor represents that it has determined and verified all materials, field measurements, and field construction criteria, and that it has checked and coordinated the information contained with the requirements of the Work and the Contract. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract by the City's approval of shop drawings, product data, or samples. No portion of the Work requiring submission of shop drawings, product data, or samples shall be commenced until the submittal has been approved by the City. Three (3) copies of each submittal shall be submitted.

Use of Site: The Contractor shall confine the Work to areas permitted by the Contract Documents and any applicable laws, ordinances or permits and shall not unreasonably encumber the Project with any materials or equipment.

Cutting, Patching and Restoration of Work: The Contractor shall be responsible for all cutting, fitting, patching and restoration of the Work or of the work of other contractors or of existing work of the City. The Contractor shall not cut or alter the work of the City or of another contractor without the consent of the City.

Cleaning Up: At all times, the Contractor shall keep the site free from accumulation of waste materials or rubbish. At the completion of the Work, the Contractor shall remove all waste materials and rubbish from and about the Project, as well as all tools, construction equipment, and surplus materials. If the Contractor fails to clean up at the completion of the Work, the City may do so, and the cost shall be charged to the Contractor.

3.6 SUBCONTRACTORS

A. Absence of Contractual Relationship: Nothing contained in the Contract Documents shall operate to, or otherwise have the effect of, creating a contractual relationship between the City or the Architect and any Subcontractor.

B. Award of Subcontracts and Other Contracts for Portions of the Work:

1. Unless otherwise specified in the Contract Documents, within ten (10) Calendar Days after the award of the Contract, the Contractor shall submit a written statement to the City setting forth the name, address, and telephone number of each proposed Subcontractor and sub-subcontractor and the portion of the Work and materials for which each such Subcontractor or sub-subcontractor is responsible. The Contractor also must furnish any other information intended to prove that the proposed Subcontractor or sub-subcontractor has the necessary facilities, skill, integrity, safety records, past experience and financial resources to perform the Work in accordance with the terms and conditions of the Contract Documents.
2. If the City finds, in its sole and absolute discretion, that the proposed Subcontractor or Sub-subcontractor is not responsible or is otherwise not qualified to perform its work, the Contractor will be notified promptly in writing. If no such notice is provided, the City shall be deemed to have accepted the Subcontractor. The City may retract its acceptance of any Subcontractor or sub-subcontractor in the event such Subcontractor or sub-subcontractor evidences an unwillingness or inability to perform its work in strict accordance with the Contract Documents. Notice of such retraction will be given in writing to the Contractor. Upon receipt of notification of such rejection or retraction, the Contractor shall submit a new Subcontractor or sub-subcontractor for the City's review. Any net increase in the Contractor's cost of performance resulting from the required substitution(s) shall be adjusted by appropriate Change Order, provided, however, that no increase in the Contract Sum will be allowed for substitutions where the rejected Subcontractor or sub-subcontractor is unlicensed, debarred, or otherwise manifestly not capable of performing in accordance with the Contract Documents.
3. The Contractor shall not enter into a subcontract with any Subcontractor who has been rejected by the City and/or the Architect.

4. By an appropriate agreement, the Contractor shall require each Subcontractor, for which it executes a subcontract, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all of the obligations and responsibilities which the Contractor, by these documents, assumes toward the City.
5. Upon request, the Contractor promptly shall file with the City a conformed copy of any one or more of its subcontracts.
6. The City's review or acceptance of Subcontractors or sub-subcontractors as described herein shall not relieve the Contractor of any of its responsibilities, duties and liabilities hereunder. The Contractor shall be solely responsible to the City for the acts, defaults, or omissions of its Subcontractors and of its Subcontractors' officers, authorized representatives and employees.

C. Subcontractor Bonds: The Contractor shall require such bonds of any Subcontractors as may be specified in the Instructions to Bidders.

D. Payments to Subcontractors: Within seven (7) Calendar Days after receipt of payment from the City, the Contractor shall:

1. Pay each Subcontractor an amount equal to the percentage of the Work attributable to such Subcontractor, less an amount equal to the percentage of payments to be retained by the City from the Contractor; or
2. Notify the City and the Subcontractor in writing of the intention to withhold all or part of the amounts due a Subcontractor pursuant to subsection 3.6(D) (1), and state the reason for such withholding.

3.7 SEPARATE CONTRACTS

- A. **City's Right to Award Separate Contracts:** The City reserves the right to award separate contracts in connection with other portions of the Project or other construction or operations on the site.
- B. **Separate Contractors:** When separate contracts are awarded for different portions of the Project or other construction or operations on the site of the Project, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate contract for construction.
- C. **Coordination with Separate Contractors:** At no additional cost to the City, the Contractor shall coordinate the Work with the activities of each separate contractor. When directed to do so by the City, the Contractor shall participate with separate contractors and the City in reviewing their separate construction schedules and shall make any revisions to the construction schedule necessitated thereby.

- D. **Cooperation with Separate Contractors:** The Contractor shall afford the City and any separate contractor's reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.
- E. **Defects in Work by Separate Contractors:** If part of the Contractor's Work depends for proper execution or results upon construction or operations by a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the City in writing any apparent discrepancies or defects in such construction or operations performed by a separate contractor that would render it unsuitable for such proper execution and results. Failure of the Contractor to report such apparent discrepancies and/or defects shall constitute an acknowledgment that the separate contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

3.8 TIME

- A. **Time of Start and Completion:** The Contractor shall commence Work within ten (10) Calendar Days after the issuance of the Notice to Proceed. The Contractor shall prosecute the Work diligently, using such means and methods of construction as will secure its full completion in accordance with the requirements of the Contract Documents, and shall achieve Substantial Completion of the Work within the Contract Period. By executing the Contract, the Contractor confirms that the Contract Period is a reasonable period for the Substantial Completion of the Work. The Contractor shall achieve Final Completion of the Work within thirty (30) Calendar Days after Substantial Completion. The actual Dates of Substantial and Final Completion shall be established by the Architect after inspections have been conducted in accordance with Sections 3.13D and 3.13D5 hereof.
- B. **Liquidated Damages:** The City and the Contractor hereby acknowledge and agree that time is of the essence with respect to this Contract and that in the event the Contractor fails to substantially complete the Work within the Contract Period; the City will incur actual and considerable monetary damage, the actual amounts of which are uncertain and not readily ascertainable. Liquidated Damages shall be assessed at the rate of one thousand three hundred and fifty dollars (\$1,350.00) per Calendar Day for each Calendar Day of delay. The amount stipulated in the Contract Documents is reasonably in proportion to the probable loss to the City and that amount per Calendar Day is hereby agreed upon as liquidated damages (hereinafter "Liquidated Damages") for each Calendar Day that the time consumed in substantially completing the Work exceeds the Contract Period, as adjusted by written Time Extensions and Change Orders. This amount shall in no event be considered as a penalty or otherwise than as the liquidated and adjusted damages to the City because of the delay, and the Contractor and its Surety hereby agree that the stated sum per day for each such day of delay shall be deducted and retained out of the monies which may become due hereunder, and if not so deductible, the Contractor and its Surety shall be liable therefore.

Contractor waives any defense as to the validity of any liquidated damages stated in this Contract as they may appear on the grounds that such liquidated damages are void as penalties or are not reasonably related to actual damages.

C. Schedules:

1. Construction Schedule: Promptly after award of the Contract, the Contractor shall prepare and submit to the COTR and the Architect a construction schedule for the Work. The construction schedule shall be a Critical Path Method schedule or other schedule in form reasonably acceptable to the Architect and the COTR, and shall provide for completion of the Work within the Contract Period provided in the Contract Documents. The construction schedule shall be revised monthly, or at other appropriate intervals as directed by the Architect or the COTR.
2. Submittal Schedule: The Contractor shall prepare and keep current a schedule of submittals (submittal schedule) which is coordinated with the construction schedule and allows the Architect reasonable time to review all submittals.
3. Waiver of Contract Period: The City's receipt or approval of any construction schedule or submittal schedule submitted by Contractor shall not constitute a waiver by the City of the requirements of Section 3.8(A). The Contract Period may be adjusted only by a written Time Extension or Change Order signed by the Purchasing Agent.

D. Time Extensions:

1. The parties agree that no Time Extension extending the Contract Period shall be effective unless granted in writing, and signed by the Purchasing Agent. Notice of delay shall be given in writing to the COTR and the Purchasing Agent within five (5) Business Days of its occurrence. In case of a continuing cause of delay, only one notice shall be required. The Contractor shall apply for any Time Extension in writing, setting forth in detail the reasons for and causes of the delay, and an estimate of the probable cost and effect of such delay on the progress of the Work, and shall submit its application to the COTR not more than twenty (20) Calendar Days after the commencement of the delay; otherwise the application for extension shall be waived.
2. If such an application is made, the Contractor shall be entitled to a Time Extension for delay in completion of the Work if obstructed or delayed in the commencement, prosecution or completion of any part of the Work by any act or delay of the City, or persons for which it is responsible, or by riot, insurrection, war, pestilence, acts of public authorities, fire, earthquakes, or by strikes, or other causes beyond the control and without the fault or negligence of the Contractor.

3. The Contractor shall be entitled to a Time Extension for such causes only for the number of days of delay which are due solely to such causes and only to the extent that such occurrences actually delay the completion of the Project, and then only if the Contractor shall have strictly complied with all applicable requirements of this Contract, including, without limitation, Sections 3.8D1 and 2.
 4. If adverse weather conditions are the basis for a Time Extension request, such request shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.
 5. In the event the Contractor is denied a Time Extension hereunder, he may contest such decision by filing a claim as provided in Section 3.15. No claim for a Time Extension under this provision will be valid unless submitted as stated herein.
 6. Delays caused by the failure of the Contractor's material men, manufacturers, and dealers to furnish approved working drawings, materials, fixtures, equipment, appliances, or other fittings on time or the failure of Subcontractors or sub-Subcontractors to perform their work in conformity with the Construction Schedule shall not constitute a basis for extension of time.
 7. Except as otherwise provided in Section 3.8., no claim for payment, compensation or adjustment of any kind (other than the Time Extensions provided for herein) shall be made or asserted against the City by the Contractor for damages caused by hindrances or delays from any cause, whether such hindrances or delays be avoidable or unavoidable, and the Contractor agrees that he will make no claim for damages by reason of any such hindrances or delays, and will accept in full satisfaction of such hindrances or delays a Time Extension to complete performance of the Work as specified.
 8. Where portions of the Work have been phased in order to accommodate City's use of existing premises, and the beginning date and ending date for the performance of the phased Work have been stipulated, and the beginning date must be changed to accommodate unforeseen circumstances, then the ending date shall accordingly be adjusted so that the amount of time allotted for the phased Work shall not change.
- E. Unreasonable Delays:** The provisions of Section 3.8E are not intended to waive, release or extinguish any rights of the Contractor to recover costs or damages for unreasonable delays in performing this Contract, if and to the extent that such delay is caused solely by acts or omissions of the City, its agents or employees, and due to causes within their control.
- The parties agree that the term "unreasonable delay" as used herein shall mean only a delay which singularly and in itself exceeds five percent (5%) of the total time allotted to the Contractor to achieve beneficial use of the Work under this Contract (including any agreed-upon modifications):

1. Where the Contractor has provided written notice; and
2. Where the delay is:
 - a) Caused by the City's bad faith or it willful, malicious, or grossly negligent conduct; or
 - b) So severe that it constitutes an intentional abandonment of this Contract by the City; or
 - c) Results from the City's breach of a fundamental obligation under this Contract; or
 - d) Is beyond the contemplation of the parties on the date the parties entered into this Contract.
3. The term "intentional abandonment" shall mean that the City has failed to take or to attempt to take action to fulfill its material obligations under this Contract and that the City has demonstrated no intention of resuming the Contract. The term "fundamental obligation" shall mean only the City's obligations under this Contract to pay amounts to the Contractor when due, to furnish City-supplied materials or equipment (if any), and to secure (if required) permits or title to land or rights of way necessary and indispensable to the prosecution of the Work.
4. The parties recognize the difficulty in calculating damages incurred by the Contractor resulting from unreasonable delays caused by acts or omissions of the City, its agents or employees, and the parties hereby agree that the amount set forth in Section 3.8B as Liquidated Damages payable by the Contractor shall be the liquidated damages for each and every Calendar Day that the Contractor incurs compensable costs or damages for unreasonable delays in performing this Contract as aforesaid, and that this figure represents accurate forecast of anticipated actual damages in the event of an unreasonable delay.
5. The Contractor making a claim against the City for costs or damages due to unreasonable delays caused by the City, and its agents or employees, shall be liable to the City for a percentage of all the costs the City incurs in investigating, analyzing, negotiating, and litigating the claims, which percentage shall be equal to the percentage of the Contractor's total delay claim which is determined through litigation or arbitration to be false or to have no basis in law.

3.9 CHANGES IN THE WORK

- A. **Change Orders:** The City may order changes in the Work consisting of additions, deletions, or modifications, the Contract Sum and the Contract Period being adjusted accordingly. Such changes in the Work shall be authorized only by written Change Order signed by the Purchasing Agent. The Contract Sum and the Contract Period shall be changed only by Change Order signed by the Purchasing Agent.

B. Disputed Work: If the Contractor is of the opinion that any Work required, necessitated, or ordered by the Architect or the City, or any action required or ordered by the Architect or the City to be taken or not taken violates the terms and provisions of this Contract, he shall, within four (4) Business Days of commencing such Work or action, notify the City and the Architect, in writing, of its contentions with respect thereto and request a final determination thereof. The Purchasing Agent will make a determination within ten (10) Business Days of the written request. In order to reserve its right to claim compensation for such Work, or damages resulting from such compliance, the Contractor shall, within two (2) Business Days after receiving notice of the Purchasing Agent's determination and direction, notify the City, in writing, that the Work is being performed or that the determination and direction is being complied with under protest. Failure of the Contractor to so notify the City as provided herein shall constitute a waiver and release of the Contractor's right to claim compensation for any Work or damages resulting from such compliance. Nothing herein shall alter the Contractor's obligation to comply with any other provision of the Contract Documents.

C. Change Order Overhead and Profit.

1. The percentages for overhead, profit and commission to be allowed for net increases in the Contractor's cost caused by Change Order work shall in no case be allowed to exceed the following:

	Overhead	Profit	Commission
To the Contractor for Work performed by its own forces	10%	Plus 5%	--
To Contractor for Work Performed by other than its own forces	--	--	10%
To the Subcontractor for Work Performed by other than its Own forces	--	Plus 5%	--

2. The mark-ups allowed for overhead and profit shall fully compensate Contractor for all of the following:
 - a) Insurance (other than mentioned under "costs" below);
 - b) Field and office supervisors and assistants, and wages of timekeepers, clerks, and watchmen;
 - c) Use of hand tools;
 - d) Average job engineering, stakeout and layout;
 - e) Incidental job burdens;
 - f) General Office expenses, including estimating, submitting and processing the change;
 - g) All administrative costs required by reasonable extension of time if extension of the Contract Period is necessary because of the change; and
 - h) All other expenses not included below as "cost."

3. The net cost of the Change Order shall be computed to include actual cost of:
 - a) Labor, including pro-rated charges for foremen;
 - b) Materials entering permanently into the Work, including cost of transportation;
 - c) Ownership or rental cost of construction plant and equipment during time of use for the extra work;
 - d) Power and consumable supplies for the operation of power equipment;
 - e) Worker's compensation insurance and labor benefits required under collective bargaining;
 - f) Social Security and old age and unemployment insurance;
 - g) Bond premiums; and
 - h) Applicable taxes.

4. In submitting its Change Order proposal, the Contractor shall provide a complete cost breakdown that lists and substantiates each item of Work and each item of cost.

3.10 DIFFERING SITE CONDITIONS

If the Contractor encounters conditions at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contracts Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then the Contractor shall give the COTR and the Purchasing Agent written Notice, promptly, before conditions are disturbed, and in no event later than five (5) Calendar Days after first observance of the conditions. The Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, an appropriate Change Order shall be issued in accordance with Section 3.9.

3.11 TESTS AND INSPECTIONS

- A. **Contractor to Make Arrangements for Tests:** Unless otherwise provided, Contractor shall make arrangements for such tests, inspections and approvals as may be required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction. Contractor shall give the COTR timely notice of when and where tests or inspections are to be made so the City may observe such tests or inspections.

- B. **City's Right to Observe Tests:** The COTR and the Architect shall at all times have access to the site and to the Work for purposes of performing and observing tests and inspections.

C. Uncovering of Work:

1. If a portion of the Work is covered contrary to the Architect's request or to the requirements contained in the Contract Documents, the Contractor shall, at its own expense and upon the written request of the Architect or City, uncover and replace such Work without an adjustment to the Contract Period.
2. If a portion of the Work has been covered which the Architect has not specifically requested to observe prior to it's being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be charged to the City. If such Work is not in accordance with the Contract Documents, the Contractor shall pay the costs of uncovering and replacing such Work.

D. Correction of Work: The Contractor shall promptly correct any Work which fails to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs associated with the correction of any such Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby.

E. Contractor Obligated to Perform in Accordance with Contract Documents: Acceptance by the City of test data or inspections of any portion of the Work shall not relieve Contractor of Contractor's obligation to perform the Work as required by the Contract Documents.

F. Waiver of Defects: Failure of the COTR or the Architect during the progress of the Work to discover or reject defective Work or Work not in accordance with the Contract Documents shall not be deemed an acceptance thereof or a waiver of the City's rights to a proper execution of the Work or any part of it. No partial or Final Payment or partial or entire occupancy of the Project by the City shall be construed to be an acceptance of the Work or materials which are not in accordance with the Contract Documents, nor a waiver of the City's rights.

G. Acceptance of Defective or Nonconforming Work: The City reserves the right to accept any defective Work or Work not in compliance with the Contract Documents, provided, however, that in such event the Contract Sum shall be reduced by an appropriate and equitable amount to account for such defect or noncompliance. Such adjustment shall be effected whether or not Final Payment has been made pursuant to Section 3.26B hereof.

3.12 WARRANTY

A. General Warranty: The Contractor warrants that the materials and equipment furnished under this Contract will be of good quality and new, unless otherwise specified, that Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract

Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, will be considered defective.

- B. **One Year Continuing Warranty; Equipment Warranties:** In addition to any specific warranty required by the Contract Documents, Contractor shall perform the Work in a good, workmanlike manner and warrant all Work against defects in material or workmanship for a period of one (1) year from the date of Final Completion, unless specified otherwise. Contractor shall secure and assign to the City all written warranties of equipment or materials furnished to Contractor or its Subcontractors by any manufacturer or supplier.
- C. **Commencement of Warranties:** All periods of construction warranty, and periods of manufacturers' product and/or equipment warranties shall commence on the date of Final Completion of the Work and shall extend for a minimum period of twelve (12) months thereafter.

3.13 PAYMENTS AND COMPLETION

A. Contract Sum:

1. For the Contractor's complete performance of the Work, the City agrees to pay, and the Contractor agrees to accept, subject to the terms and conditions hereof, the Contract Sum, taking into consideration any deductions based on award of a combination of alternates, if applicable, plus the amount of any Change Orders issued under Section 3.9.
2. The amount awarded as a unit price for any unit price Contract item shall represent payment in full for all material, equipment and labor necessary to complete, in conformity with the Contract Documents, each unit or item of Work shown, specified, or required under such unit price Contract item.
3. No payment other than the amount awarded will be made for any class of Work included in a lump sum Contract item or a unit price Contract item, unless specific provision is made therefore in the Contract Documents.

- B. **Schedule of Values:** Within ten (10) Business Days after the Notice of Award, and in any event, prior to the first application for partial payment, the Contractor shall submit to the COTR and the Architect a proposed Schedule of Values setting forth a reasonable allocation of the Contract Sum to the various elements of the Work. The Schedule of Values, once accepted by the City, may be used for checking the Contractor's applications for partial payments hereunder but shall not be binding upon the City or the Architect for any purpose whatsoever.

C. Partial Payments:

1. Monthly Payments; Retainage: On or about the first (1st) of each month, the Contractor shall make and certify an estimate of the amount and fair value of the Work performed and may apply for partial payment.

Thereafter, the Architect or the COTR may, in their discretion, revise the estimate to show the actual value of Work completed in accordance with their observation of the Work. The Contractor agrees to be bound by the Architect's and the City Representative's revisions to its applications for partial payment. Whenever the monthly estimate, after approval by the Architect and the City Representative, shows that the value of the Work completed during the previous month exceeds one thousand dollars (\$1,000.00), the Architect will issue a Certificate of Payment for such Work. Such Certificate will authorize payment by the City in an amount equal to the value of the Work completed less any sums retained or deducted by the City under the terms of the Contract Documents, and less retainage of five (5) percent of payments claimed. In accordance with Section 3-3-56 of the Code of the City of Alexandria, within forty-five (45) Calendar Days after receipt of each Certificate of Payment, the City shall pay the Contractor in accordance with the applicable Certificate and the Contract Documents. Within thirty (30) Calendar Days of the submission of the application for partial payment, the City will notify the Contractor of any defects or improprieties that would prevent payment by the scheduled payment date.

2. Escrow Account in Lieu of Retainage: The Contractor may elect to use the escrow account procedure for utilization of retainage funds authorized by Section 3-3-51 of the Code of the City of Alexandria. In the event the Contractor elects to use the escrow account procedure, it shall submit an escrow agreement form, executed by the appropriate parties, within fifteen (15) Calendar Days after Notification of Award. The escrow agent shall be a trust company, bank or savings institution with its principal office located in the Commonwealth of Virginia. A copy of the approved escrow agreement form is included as a Required Submittal in the Bid Documents or is available from the Purchasing Agent. If the Contractor fails to submit a fully executed escrow agreement, in proper form, within the required fifteen (15) Calendar Days, it shall forfeit its right to use the escrow account procedure and shall be subject to normal withholding of retainage.
3. City's Right to Withhold Payment. The City may withhold payment to such extent as may be necessary to protect the City due to loss because of:
 - a) Defective Work not remedied;
 - b) Third party claims filed or reasonable evidence indicating probable filing of such claims;
 - c) Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
 - d) Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
 - e) Damage to the City or another contractor;
 - f) Reasonable evidence that the Work will not be completed within the Contract Period;
 - g) Persistent failure to carry out the Work in accordance with the Contract Documents; or

- h) Liability, damage, or loss due to injury to persons or damages to the Work or property of other contractors, subcontractors or others, caused by the act or neglect of the Contractor of any of its Subcontractors.
- 4. Application of Withheld Funds: The City shall have the right, as an authorized representative for the Contractor and without the Surety's consent, to apply any such amounts so withheld in such manner as the City may deem proper to satisfy such claims or to secure such protection. The application of these amounts shall be deemed payments for the account of the Contractor and shall reduce the City's obligation to the Contractor accordingly.
- 5. Limitation on Payments: Unless otherwise provided herein, no partial payment will be made for any materials or equipment supplied hereunder before they are (i) incorporated in the Work in a permanent manner required by the Contract Documents, (ii) properly stored at the site of the Project, or (iii) properly stored in a bonded warehouse to the satisfaction of the City.
- 6. Payments for Materials Stored on Site: The cost of equipment and non-perishables delivered and stored at the site of the Project and tested for adequacy may be included in the Contractor's application for partial payment, provided, however, that the Contractor shall furnish written evidence satisfactory to the City that the Contractor is the owner of such materials or equipment at the time of payment therefore by the City and that such equipment is being stored and maintained in accordance with the Contract Documents and the manufacturer's recommendations. The amount to be paid by the City for such equipment and non-perishables will be ninety percent (90%) of the invoice cost to the Contractor as supported by receipted bills. Such payment shall not relieve the Contractor of full responsibility for completion of the Work and for protection of materials and equipment until incorporated in the Work in a permanent manner as required by the Contract Documents.
- 7. Conditions Precedent to Partial Payments: Before any payment will be made under this Contract, the Contractor and every Subcontractor, if required, shall deliver to the Architect a written, verified statement, in satisfactory form, showing in detail all amounts then due and unpaid by the Contractor to all laborers, workers, and mechanics, employed under the Contract for the performance of the Work at the site of the Project, for daily or weekly wages, or to other persons for materials, equipment, or for supplies delivered at the site of the Project during the period covered by the payment request.

D. Substantial Completion:

- 1. When the Contractor considers that the Work, or such portion thereof which the City agrees, in writing, to accept separately, is substantially complete, the Contractor shall give the COTR and the Architect written notice of such fact, together with a list of any items acknowledged to be incomplete or not in accordance with the Contract Documents.

The Contractor shall also give notice to Code Enforcement and obtain any necessary inspections and correct any deficiencies as a condition for Substantial Completion.

2. Upon receipt of the Contractor's notice, the Architect will make an inspection to determine whether the Work or such designated portion thereof, is substantially complete. If the Architect's inspection discloses any items, whether or not included on the Contractor's list, which are incomplete and not in accordance with the requirements of the Contract Documents, and which prevent Substantial Completion, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such items upon notification by the Architect. The Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. At the time of the issuance of the Certificate of Substantial Completion, the Architect and the City shall provide the Contractor a comprehensive punch list of items to be completed and/or corrected. The Contractor shall proceed promptly to complete and correct items on the punch list. Failure to include an item on the punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.
3. When the Work, or such designated portion thereof, is substantially complete, the Architect shall prepare and issue a Certificate of Substantial Completion (in the form of AIA Document G704) which shall establish the date of Substantial Completion, the responsibilities of the City and the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the City and to the Contractor for their written acceptance of responsibilities assigned to each of them therein.
4. Upon Substantial Completion of the Work, or such designated portion thereof, and upon application by the Contractor and issuance of a Certificate of Substantial Completion by the Architect, the City shall make payment, less retainage, for such Work or such portion thereof as provided in the Contract Documents.
5. Final Completion and Final Payment: Upon written notification by the Contractor that the Work is finally complete, and upon the Contractor's submission of a final application for payment, the Architect will conduct a final inspection of the Work. When the Architect determines that the Work has been satisfactorily completed and the Contract Documents fully performed, he shall promptly prepare and issue a Final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of its observations and inspections, the Work has been completed in accordance with the Contract Documents and that the amount stated in the Final Certificate of Payment is due and payable.

- E. Conditions Precedent to Final Payment:** Neither final payment nor any retainage shall become due until the Contractor submits to the Architect (i) an affidavit that payrolls, bills for materials and equipment, and all other indebtedness in connection with the Work for which the City might be responsible have been paid or otherwise satisfied; (ii) a certificate evidencing that insurance required by the Contract Documents to remain in force following final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been provided to the City; (iii) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents; (iv) consent of the Surety to final payment; (v) a written statement of all claims expressly reserved by the Contractor; (vi) if required by the City, other data establishing the payment or satisfaction of obligations (such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract) and such guaranties and indemnities all in such form and detail as may be required by the City; and (vii) all as-built drawings, copies of warranty documents and equipment manuals. If a Subcontractor refuses to furnish a release or waiver required by the City, the Contractor may furnish a bond satisfactory to the City, in its sole and absolute discretion, sufficient to indemnify the City against any claim or lien. If any such claim remains unsatisfied after payments are made, the Contractor shall refund to the City all money that the City may be compelled to pay in discharging such claim, including all costs associated therewith, including reasonable attorneys' fees.
- F. Delay in Final Completion:** If, after the Date of Substantial Completion, Final Completion of the Work is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting the Date of Final Completion, and the Architect so concurs, the City shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due, less one hundred fifty percent (150%) of the estimated cost of any remaining Work. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.
- G. Waiver of Claims:** The Contractor's acceptance of Final Payment constitutes a waiver and release of all claims not expressly reserved in writing by the Contractor in accordance with Section 3.15.

3.14 TERMINATION

- A. Non-Appropriation of Funds:** This Contract is conditioned upon an annual appropriation made by the City Council of the City of Alexandria of funds sufficient to pay the compensation due the Contractor under this Contract. If such an appropriation is not made in any fiscal year, and the City lacks funds from other sources to pay the compensation due under this Contract, the City will be entitled, at the beginning of or during such fiscal year, to terminate this Contract. In that event, the City will not be obligated to make any payments under this Contract beyond the amount properly appropriated for Contract payments in the immediately prior fiscal year.

The City will provide the Contractor written notice of termination of this Contract due to the non-appropriation of funds at least fifteen (15) calendar days before the effective date of the termination. However, the City's failure to provide such notice will not extend this Contract into a fiscal year in which funds for Contract payments have not been appropriated.

B. Termination for Convenience: The City shall have the right to terminate this Contract at its own convenience for any reason by giving fifteen (15) days prior written notice of termination to the Contractor. In such event, the Contractor shall be paid an amount equal to the lesser of: (1) the actual cost of any Work, labor or materials actually performed or in place and the actual cost of any labor, equipment or materials ordered in good faith which could not be canceled, less the salvage value thereof, plus ten percent (10%), or (2) the pro rata percentage of completion based upon the Schedule of Values (as described in Section 3.13B) plus the actual cost of any labor, equipment or materials ordered in good faith which could not be canceled, less the salvage value thereof. Each subcontract shall contain a similar termination provision for the benefit of the Contractor and the City. The Contractor shall not be entitled to receive anticipated profits on unperformed portions of the Work. The City shall have the right to employ an independent accounting firm to verify any amounts claimed by the Contractor to be due under this Paragraph. The City shall have the right of audit (and Contractor shall have the obligations) stated in Section 3.26, insofar as they pertain to amounts claimed to be due hereunder.

C. Termination for Default:

1. The parties agree that:

- a) If the Contractor fails to begin the Work when required to do so; or it
- b) If, at any time during the progress of the Work, the City determines that the Contractor is not prosecuting the Work with reasonable speed and diligence, or is delaying the Work unreasonably or unnecessarily; or
- c) If the force of workmen or the quality or quantity of material furnished is not sufficient to insure completion of the Work within the Contract Period and in accordance with the Contract Documents; or
- d) If the Contractor fails to make prompt payments to suppliers or to Subcontractors for Work performed in connection with this Contract; or
- e) If the Contractor fails in any manner of substance to observe the provisions of this Contract; or
- f) If any of the Work, machinery, or equipment is defective and is not replaced as herein provided; then the City, without prejudice to any other rights or remedies it may have hereunder, shall have the right to declare the Contractor in default in whole or in part. In the event the City elects to declare the Contractor in default, the City shall notify the Contractor and its Sureties by written Notice describing the nature of the default and providing the Contractor a right to cure such default within seven (7) calendar days after the date of the Notice, or within such longer period as the City, in its sole and absolute discretion, may prescribe.

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In the event the default is not cured within the time period specified by the City, the City shall have the right to take any actions necessary to correct or complete the Work, provided however, that if the Contractor is declared to be in default under this paragraph more than twice during the course of performance of this Contract, then upon the third or subsequent such default, the City may proceed to terminate the Contract without further notice to the Contractor or the Surety, whether such prior default(s) shall have been cured.

2. The parties further agree that:
 - a) If legal proceedings have been instituted by others than the City in such manner as to interfere with the progress of the Work and to potentially subject the City to the peril of litigation or outside claims; or
 - b) If the Contractor is adjudicated bankrupt or makes an assignment for the benefit of creditors; or
 - c) If in any proceeding instituted by or against the Contractor, an order is made or entered granting an extension of the time of payment, composition, adjustment, modification, settlement or satisfaction of its debts or liabilities; or
 - d) If a receiver or trustee is appointed for the Contractor or the Contractor's property; or
 - e) If this Contract or any part hereof is sublet without the prior written consent of the City; or
 - f) If this Contract or any rights, monies, or claims hereunder are assigned in whole or in part by the Contractor, otherwise than as herein specified; or
 - g) If the Work to be done under this Contract is abandoned; then, without prejudice to any other rights or remedies the City may have, the City shall have the right to terminate this Contract immediately, upon written notice to the Contractor.
3. Immediately, but no later than three (3) Business Days after receipt of notice of termination under subparagraphs (A) or (B) of this section, the Contractor shall discontinue all further operations in connection with the Work, or such specified part thereof, and shall immediately vacate the site, or such specified part thereof, leaving untouched all plant, materials, equipment, tools, supplies and job site records.
4. If the Contractor defaults or neglects to perform the Work in accordance with the Contract Documents and fails within a three (3) Business Days period after receipt of written notice from the City to commence and continue correction of such default or neglect, the City may, without prejudice to the other rights the City may have, correct such defaults or deficiencies by such means and in such manner, by contract with or without public letting, or otherwise as it may deem advisable, utilizing for such purpose without additional cost to the City such of the Contractor's plant, materials, equipment, tools and supplies remaining on the site, and also such Subcontractors as it may deem advisable and may take any or all of the following actions:

- a) Delete part or parts of the Work from this Contract and contract to have it performed by others;
 - b) Supplement the Contractor's work force;
 - c) Withhold payments due the Contractor and use such payments to satisfy any claims for monies owed by the Contractor in connection with the Project, in accordance with Paragraph 3.13.C3;
 - d) Replace or repair any defective Work, machinery or equipment; or
 - e) Terminate the Contractor.
5. The Contractor and its Sureties shall bear all costs associated with completing or correcting the Work, including without limitation, the cost of reletting, the amount of any liquidated damages, and any and all costs incurred in connection with the actions listed in this Section 3.14. Any costs incurred in connection with completing or correcting the Work shall be deducted from the amounts then or thereafter due the Contractor. In the event such amounts are not sufficient to cover the costs incurred in connection with completing or correcting the Work, the Contractor and its Surety shall pay to the City the amount of any deficiency.

D. Force Majeure: Except for defaults of Subcontractors at any tier, the Contractor shall not be liable for any excess costs if the failure to perform this Contract arises from causes beyond the control and without the fault or negligence of the Contractor. Excusable causes include, but are not limited to, acts of God or of the public enemy and acts of the federal or state government in either their sovereign or contractual capacities. If the failure to perform is caused by the default of a subcontractor at any tier, and if the cause of the default is beyond the control of both the Contractor and the subcontractor, and without the fault or negligence of either, the Contractor shall not be liable for any excess costs for failure to perform, unless the subcontracted goods or services were obtainable from other sources in sufficient time for the Contractor to meet the required delivery schedule.

3.15 CLAIMS AND DISPUTES

- A. Claims: Contractual claims shall be submitted in writing not later than sixty (60) Calendar Days after the date of Final Payment, provided however, that any claim not expressly reserved by the Contractor at the time of Final Payment, shall be deemed to be forever waived and released, in accordance with Paragraph 13.07. No claim shall be considered by the City (and will be deemed to have been waived), unless the Contractor gives written Notice of an intention to file such a claim at the time of the occurrence of the event giving rise to the claim or at the beginning of the Work upon which the claim is based. Written Notice of the Contractor's intention to file a claim pursuant to Section 3.13 shall not be sufficient unless Contractor complies with each of the following:
1. The Contractor shall, within five (5) Business Days after the occurrence of the event giving rise to such claim or the beginning of the Work upon which the claim is based, deliver to the Purchasing Agent and the Contracting Officer's Technical Representative written Notice specifying that the Contractor has

sustained or is sustaining injury, and detailing the basis of the claim against the City.

2. Within twenty (20) Business Days after delivering such Notice, the Contractor shall deliver to the Purchasing Agent and the Contracting Officer's Technical Representative a sworn affidavit incorporating an itemized breakdown of the nature and amounts of any damages it has incurred or is incurring. This itemized breakdown shall be made to the fullest extent possible; otherwise the claim shall be deemed to be waived.
 3. The Purchasing Agent or its designee shall make a determination of the claim within fifteen (15) Business Days after receipt of the itemized breakdown described in subparagraph B above, which decision shall be the final determination of the City.
- B. **Claims against City Officials:** The Contractor shall make no claim whatsoever against any elected official, appointed official, authorized representative or employee of the City for, or on account of, anything done or omitted to be done in connection with this Contract.
- C. **Disputes:** Disputes shall be resolved in accordance with Sections 3-3-107 and 3-3-108 of the Code of the City of Alexandria, as it may be amended from time to time.

3.16 PROTECTION OF PERSONS AND PROPERTY

- A. **Health and Safety Program:** The Contractor shall establish and maintain a program to protect the safety and health of all persons (employees, visitors, public) on the site. The program shall designate the individual responsible for implementation of the program, and establish procedures for coordinating safety and health activities with other employers on the site. The program shall meet the requirements of the Virginia Occupational and Health Standards for the Construction Industry 29 CFR Parts 1926.20 and 1926.21, and the American National Standards Institute A10.38-1991 and A10.33-1992.
- B. **Fences and Barriers:** The Contractor shall be responsible for erecting and maintaining (in a design, form, size and manner which is acceptable to City) barricades, construction fences, cordons, or other physical safeguards necessary for protection of persons and property, as well as for posting danger signs and other warnings against hazards and notifying owners and users of adjacent sites and utilities. The Contractor shall also be responsible for promulgating, instituting, and maintaining the safety standards outlined in the Contract.
- C. **Risk of Loss:** During performance of the Work and until final acceptance thereof, the Contractor shall be under an absolute obligation to protect the finished and unfinished Work against any damage, loss, or injury. The Contractor shall take proper precautions to protect the finished Work from loss or damage, pending completion and final acceptance of all Work included in the Contract.

Such precautions shall not relieve the Contractor from any and all liability and responsibility for loss or damage to the Work occurring before final acceptance by the City. Such loss or damage shall be at the risk of and borne by the Contractor, whether arising from acts or omissions of the Contractor or others and whether or not covered by the Contractor's builder's risk insurance. In the event of any such loss or damage, the Contractor shall forthwith repair, replace, and make good the Work without extension of time. Therefore, the Contractor shall take special precautions throughout all its operations to guard against fire and shall reduce the amount of inflammable materials stored at the site to the minimum amount consistent with the proper handling and storing of such materials.

- D. **Safety Representative:** The Contractor shall select one or more on-site personnel whose duty shall be accident prevention. One such person shall be the Contractor's superintendent, unless otherwise designated by the Contractor in writing to the City and the Architect.

3.17 INSURANCE

- A. **Insurance Checklist:** Within ten (10) Business Days of receipt of Notice of Award, and prior to beginning Work under this Contract, the Contractor shall furnish to the Purchasing Agent a certificate or certificates of insurance, showing that the Contractor has obtained, at its own expense, all insurance coverage listed in the "City of Alexandria, Virginia, Insurance Checklist." These certificates of insurance shall list the City of Alexandria as an additional insured in the amounts and types of insurance listed in the "City of Alexandria, Virginia, Insurance Checklist."
- B. **Waiver of Subrogation:** To the extent damages are covered by property insurance during construction, the City and Contractor waive all rights against each other and against the Architect and all consultants, agents and employees of the other for damages, except such rights as they may have to the proceeds of such insurance as set forth in the Contract, provided, however, that any such waiver shall apply only to the extent of insurance proceeds actually received and only if the parties' respective insurance companies agree to such a waiver. The City or the Contractor, as appropriate, shall require of the Architect and all consultants, agents and employees of any of them similar waivers in favor of the parties enumerated herein.

3.18 INDEMNITY

The Contractor hereby assumes all liability for and agrees to indemnify and hold harmless the City and the Architect and its or their members, officers, authorized representatives and employees against any and all claims, losses, costs, damages, penalties, liabilities and fees (including reasonable attorneys' fees) and expenses resulting from any material breach of the representations, warranties and covenants of the Contractor contained in the Contract Documents or from any injuries to persons or property caused by the negligence or alleged negligence of the Contractor or its Subcontractors, employees, or authorized representatives, or in any other manner arising out of the performance of this Contract.

3.19 PERFORMANCE AND PAYMENT BONDS

- A. Performance and Payment Bonds:** The Contractor shall execute and deliver to the City Performance and Payment Bonds on a form acceptable to the City, each in an amount equal to the Contract Sum. The Performance and Payment Bonds shall be executed by a solvent and responsible surety company licensed to conduct business in the Commonwealth of Virginia, named in the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Department, and acceptable to the City. These bonds shall be issued and countersigned by a local authorized representative of such surety company who is a resident of the Commonwealth of Virginia, regularly commissioned and licensed in the Commonwealth and producing satisfactory evidence of the authority of the person or persons executing the bonds to execute them on behalf of the Surety. The Performance and Payment Bonds shall serve as security for the faithful performance of this Contract, and for the payment of all persons performing labor and furnishing materials and services in connection with this Contract. The premiums on the Performance and Payment Bonds shall be paid by the Contractor and shall be included in the Contract Sum.
- B. Substitution of Bonds:** If at any time the City shall become dissatisfied with any Surety or Sureties upon the Performance and Payment Bonds, or if for any other reason such bond shall cease to be adequate security for the Contractor, the Contractor shall within five (5) Business Days after notification of such fact, substitute acceptable bonds in such form and sum and signed by such other sureties as may be satisfactory to the City. The premiums on such bonds shall be paid by the Contractor and shall be included in the Contract Sum. No further partial payments shall be not deemed due nor shall be made until the new sureties have qualified.

3.20 EQUAL EMPLOYMENT OPPORTUNITY: The Contractor hereby agrees:

- A. Legal Compliance:** The Contractor shall be solely responsible for complying with all applicable federal, state and municipal laws, codes and regulations during the performance of this Contract.
- B. Employment of Unauthorized Alien(s):** The Contractor agrees that it does not, and shall not during the performance of this Contract knowingly employ an unauthorized alien(s) as defined in the Federal Immigration Reform and Control Act of 1986.
- C. Discrimination Prohibited:** Not to discriminate against any employee or applicant for employment on account of race, color, sex, religion, ancestry, national origin, marital status, age, sexual orientation, disability, when such person is a qualified person with a disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

- D. **Affirmative Action:** To implement an affirmative action employment program as defined in Section 12-4-3 of the Code of the City of Alexandria to ensure nondiscrimination in employment under guidelines to be developed by the Human Rights Commission of the City of Alexandria and approved by the City Council of the City of Alexandria.
- E. **EOE Statement:** To include in all solicitations or advertisements for employees placed by or on behalf of the Contractor the words “Equal Opportunity Employer” or a symbol, approved by the commission, meaning same.
- F. **Notice to Labor Unions:** To notify each labor organization or representative of employees with which the Contractor is bound by a collective bargaining agreement or other contract of the Contractor's obligations pursuant to this equal employment opportunity clause.
- G. **Reports to the City:** To submit to the City Manager and the City's Human Rights Administrator, upon request, no more frequently than annually, regular equal employment opportunity reports on a form to be prescribed by the City's Human Rights Administrator with the approval of the City Manager, except that the administrator may request more frequent special reports of particular employers provided the commission has found such employers to have violated any provision of Chapter 4, of Title 12 of the Code of the City of Alexandria.
- H. **Compliance with Federal Requirements Sufficient:** Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this subsection.
- I. **Accommodation of Disabled Workers:** To make reasonable accommodation to the known physical or mental limitations of an otherwise qualified person with a disability who is an applicant or employee unless the Contractor can demonstrate that the accommodation would impose an undue hardship on the operation of its business.
- J. **Reasonable Accommodations:** That for the purpose of this paragraph reasonable accommodation may include (i) making facilities used by employees readily accessible to and usable by persons with a disability and (ii) job restructuring, part-time or modified work schedules, acquisitions or modification of equipment or devices, the provision of readers or interpreters and other similar actions.
- K. **Undue Hardship:** That in determining whether an accommodation would impose an undue hardship on the operation of the Contractor's business, factors to be considered include but are not limited to the following:
1. The overall size of the Contractor's business with respect to the number of employees, the number and type of facilities and size of budget;
 2. The type of the Contractor's operation, including the composition and structure of the Contractor's work force; and
 3. The nature and cost of the accommodation needed.

- L. **Refusal to Employ:** That it may not deny any employment opportunity to a qualified person with a disability who is an employee or applicant if the basis for the denial is the need to make reasonable accommodation to the physical or mental limitations of the employee or applicant.
- M. **Subcontracts:** To include the provisions in Section 3.20 in every subcontract so that such provisions will be binding upon each Subcontractor.
- N. **Non-compliance:** That in the event of the Contractor's noncompliance with any provision of this equal employment opportunity clause, upon a finding of such noncompliance by the City's human rights commission and certification of such finding by the City Manager, the City Council of the City of Alexandria may terminate or suspend or not renew, in whole or in part, this Contract.

3.21 SMALL AND MINORITY AND WOMEN-OWNED BUSINESS OUTREACH

The City is committed to increase the opportunity for utilization of small, minority and women owned business in all aspects of procurement and have adopted a policy for increasing that participation. This policy is set forth in Sections 3-3-111 and 12-4-6 of the Code of the City of Alexandria. The City reserves the right to make multiple awards if the Purchasing Agent determines that such awards are in the best interest of the City and its SMBE program.

3.22 ETHICS IN PUBLIC CONTRACTING

The provisions of law set forth in Article IV of the Virginia Public Procurement Act, entitled "Ethics in Public Contracting," Va. Code §§2.2-4367 et seq., Alexandria City Code §§3-3-121, et seq.; the State and Local Government Conflict of Interest Act, Code of Virginia §§2.2-3100, et seq.; the Virginia Governmental Frauds Act, Code of Virginia §§18.2-498.1 et seq.; and Articles 2 and 3 of Chapter 10, Title 18.2 of the Code of Virginia, all as the same may be amended from time to time and are incorporated herein by reference. The Contractor shall incorporate the above clause in its contracts with each subcontractor.

3.23 LICENSING

- A. **Contractor's License:** In accordance with Section 54.1-1103 of the Code of Virginia, 1950, as amended, the Contractor and each Subcontractor shall have a valid Virginia contractor's license. The Virginia contractor's registration number for each Subcontractor shall be provided on the list of Subcontractors required by Paragraph 6.02A.
- B. **Alexandria Business Licenses:** In accordance with Chapter 1, Title 9, of the Code of the City of Alexandria, the following shall possess a current City business license:
 - 1. Contractor;

2. All Subcontractors, sub-subcontractors and vendors at any tier with a definite place of business in the City; and
3. All Subcontractors, sub-subcontractors and vendors at any tier, without a definite place of business in the City, the gross receipts of which, from business conducted in the City, are expected to exceed \$25,000 in any calendar year.

3.24 DRUG-FREE WORKPLACE

- A. Drug-Free Workplace:** During the performance of this Contract, the Contractor agrees to (i) provide a drug-free workplace for the Contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each Subcontractor or vendor.
- B. Definition:** For the purposes of this Section, “drug-free workplace” means a site for the performance of work done in connection with this Contract awarded to Contractor, in accordance with Chapter 3, Title 3, of the Code of the City of Alexandria, the employees of which are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of this Contract.

3.25 NOTICE

- A. Written Notice:** All Notices required by the terms of this Contract shall be in writing. For purposes of this section “writing” shall include facsimile transmissions and electronic mail, provided that reasonable care is used to ensure that the Notice is received by its intended recipient.
- B. Notice to Contractor:** Written Notice may be served on the Contractor by mail, courier, facsimile transmission or electronic mail to the Contractor's office at the Project or to the business address of the Contractor as stated in the Contract Documents. If delivered in person to the Contractor, written Notice shall be served on the Contractor's foreman or superintendent for the Project, or any officer or director of the Contractor.
- C. Notice to City:** Written Notice may be served on the City by mail, courier, facsimile transmission or electronic mail to the Contracting Officer's Technical Representative, with a copy to the Purchasing Agent.

3.26 AUDIT AND PRICE ADJUSTMENT

- A. **Audit:** All records, reports and documents relating to this Contract shall be maintained by Contractor for a period of three (3) years following Final Payment (the “Audit Period”). Such records, reports and documents shall be subject to review and audit by City and the City’s consultants or auditors at mutually convenient times.
- B. **Price Adjustment for Defective Cost and Pricing Data:** If any price, including profit or fee, negotiated in connection with this Contract or any Change Order or modification under this Contract, was increased by any significant amount because the Contractor furnished cost or pricing data that were not complete, accurate and current as of the date agreed upon between the City and Contractor, the price or cost shall be reduced accordingly, and this Contract shall be modified to reflect the reduction. This right to a price reduction is limited to increases resulting from defects in data under which the submission and certification of cost or pricing data were required.

3.27 MISCELLANEOUS PROVISIONS

- A. **Governing Law:** This Contract is governed by the applicable provisions of the Code of the City of Alexandria, and the laws of the Commonwealth of Virginia.
- B. **Successors, Assigns and Legal Representatives:** This Contract shall not be assigned, sublet or transferred, in whole or in part, by operation of law or otherwise, by either of the parties hereto except with the prior written consent of the other. Unless specifically stated to the contrary in any written consent to an assignment, no assignment shall operate to release or discharge the assignor from any duty or responsibility under this Contract.
- C. **Entire Agreement:** The Contract Documents constitute the entire agreement among the parties pertaining to the Work and supersedes all prior and contemporaneous agreements and understandings of the parties in connection therewith.
- D. **Royalties and Patents:** The Contract Sum includes all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the Work. Whenever the Contractor is required or desires to use any design, device, material or process covered by letters of patent or copyright, the Contractor shall indemnify and hold harmless the City and the Architect, their officers, agents and employees from any and all claims for infringement by reason of the use of any such patented design, device, tool, material, equipment, or process to be performed under this Contract, and shall indemnify the City and the Architect, their officers, agents, authorized representatives, and employees for any costs, expenses and damages which may be incurred by reason of any such infringement at any time during the prosecution and after the completion of the Work.

- E. **Severability:** Should any provision of this Contract be declared invalid for any reason, such decision shall not affect the validity of any other provisions, which other provisions shall remain in force and effect as if this Contract had been executed with the invalid provisions(s) eliminated, and it is hereby declared the intention of the parties that they would have executed the other provisions of this Contract without including therein such provision(s) which may for any reason hereafter be declared invalid.

- F. **Survival:** Any provision of the Contract that contemplates performance subsequent to any termination or expiration of the Contract shall survive any termination or expiration of the Contract and shall remain in full force and effect according to their terms.

- G. **Non-Waiver:** The failure of the Contractor or the City to exercise any right, power or option arising under this Contract or to insist upon strict compliance with the terms of this Contract, shall not constitute a waiver of the terms and conditions of this Contract with respect to any other or subsequent breach thereof or a waiver by the Contractor or City of their rights at any time thereafter to require exact and strict compliance with all the terms thereof.

- H. **Headings:** Numbered topical headings, articles, paragraphs, subparagraphs or titles in this Contract are inserted for the convenience of organization and reference and are not intended to affect the interpretation or construction of the terms thereof.

PART IV - REQUIRED SUBMITTAL A, OFFER AND AWARD FORM

NAME OF BIDDER: _____
ADDRESS: _____
TELEPHONE NUMBER: (_____) _____
MOBILE NUMBER: (_____) _____
FAX NUMBER: (_____) _____
EMAIL: _____
FEDERAL EMPLOYMENT IDENTIFICATION NO: _____
ALEXANDRIA BUSINESS LICENSE NO: (if applicable): _____
VIRGINIA CONTRACTOR'S REGISTRATION NO. (if applicable): _____

THIS OFFER AND AWARD FORM SHALL BE SIGNED

For and in consideration of the payment of the Contract Sum, as set forth in the Bid, the Bidder offers to perform the Work set forth in Invitation to Bid Number 00000505, together with any addenda, in accordance with the terms of the Bidder's submission. By signing this document, the Bidder agrees that, if its Bid is accepted within one hundred twenty (120) days from the date of the opening for the consideration mentioned, it will at its own expense do all of the Work and furnish all the materials, equipment and labor necessary to carry out this Agreement within the time specified in the Invitation to Bid pursuant to the Contract Documents identified as:

	PART	DESCRIPTION
<input checked="" type="checkbox"/>	I.	SCOPE OF WORK
<input checked="" type="checkbox"/>	II.	BID INSTRUCTIONS AND PROCESS
<input checked="" type="checkbox"/>	III.	GENERAL TERMS AND CONDITIONS FOR GOODS AND SERVICES
<input checked="" type="checkbox"/>	IV.	REQUIRED SUBMITTALS

By:

Bidder's Authorized Signatory

Date

Name and Title of Authorized Signatory

Accepted by the City of Alexandria, Virginia,

This _____ day of _____, 2015.

By:

Michael F. Hauer, CPPO, CPPB
Acting Purchasing Agent

PART IV - REQUIRED SUBMITTAL B KEY PERSONNEL FORM

KEY PERSONNEL: In the spaces provided below, the Bidder shall identify a minimum of three (3) key persons who will be assigned to provide supervision, project management, and/or contract administration. One (1) of these individuals shall be available from 9 a.m. to 5 p.m., local prevailing time on every Business Day.

KEY PERSON NAME (SUPERVISOR):

TITLE:

PHONE:

MOBILE:

EMAIL:

QUALIFICATIONS AND EXPERIENCE:

KEY PERSON NAME (PROJECT MANAGER/CONTRACT ADMINISTRATOR):

TITLE:

PHONE:

MOBILE:

EMAIL:

QUALIFICATIONS AND EXPERIENCE:

KEY PERSON NAME (PROJECT MANAGER/CONTRACT ADMINISTRATOR):

TITLE:

PHONE:

MOBILE:

EMAIL:

QUALIFICATIONS AND EXPERIENCE:

**PART IV - REQUIRED SUBMITTAL C
CITY OF ALEXANDRIA INSURANCE CHECKLIST**

I understand the insurance requirements and, if issued this Contract, will submit evidence of required insurance coverage to the City in the amount and type as set forth below (see continuation sheets). Items marked “X” are required to be provided.

	REQUIRED COVERAGE	LIMITS (figures denote minimum limits required)
X	1. Worker’s Compensation and Employer’s Liability Required when Contractor has three (3) or more employees.	Statutory limits of Commonwealth of Virginia and the state of hire for workers’ compensation, or other law mandated by a labor agreement. \$500,000 each accident; \$500,000 each disease; \$500,000 policy limit for employer’s liability. Longshore and Harbor Workers Compensation Act (USL&H) and Jones Act coverage endorsements needed for work along and on the river.
X	2. Commercial General Liability Required on all City contracts.	\$1,000,000 combined single limit for bodily injury and property damage each occurrence. \$2,000,000 General Aggregate, \$2,000,000 Products and Completed Operations Aggregate, \$1,000,000 personal injury and advertising injury Aggregate. The General Aggregate must apply on a “per project” basis, if construction related. General Liability coverage shall include: Premises/Operations, Actions of Independent Contractors, Contractual Liability, including protection for the successful Bidder from claims arising out of liability assumed under the Contract and including Automobile Contractual Liability, Personal Injury and Advertising Injury Liability, and Explosion, Collapse, and Underground hazards or damage (any type of construction work). Products and Completed Operations coverage must be maintained for at least three (3) years after the City’s Acceptance of the work.
X	3. Commercial Automobile Liability Required on all City contracts. Sole proprietor Contractors must provide evidence of business endorsement on their personal auto policy in lieu of a commercial auto liability policy.	\$1,000,000 combined single limit bodily injury and property damage each accident; \$1,000,000 The Commercial Automobile Liability coverage shall include Uninsured and Underinsured Motorists coverage. Must include the following: Owned, Hired and Non-Owned. \$5,000,000 Motor Carrier Act Endorsement, where applicable.

INVITATION TO BID (ITB) NUMBER 00000531
TAYLOR RUN EXPOSED SEWER PROTECTION PROJECT NUMBER 11-105

4.	<p>Property Coverage Required when Contractors: A. Use their own personal property or equipment on City property; B. Store or leave equipment or personal property on City property; or C. Use building material NOT owned by City.</p>	<p>Commercial Property Policy/Builders Risk: Provide replacement cost. Must include all perils (also known as “special” or “all risks”) including theft, flood, earthquake, and terrorism. <u>Contractor’s Equipment Floater</u>: Provide coverage for Contractor’s mobile equipment, including road building machinery, steam shovels, hoists, and derricks or any equipment to become part of the permanent structure used on the job by builders of structures, roads, bridges, and tunnels.</p>
5.	<p>Crime Policy <u>Required when Contractor</u>: A. Collects money, securities or other property on behalf of City; B. Requires the use of City money, securities, or negotiable property to be in Contractor’s care, custody and control; and/or C. Has access to City computer systems that may provide access to sensitive information.</p>	<p>\$1,000,000 limit for employee theft of money, securities, and other property owned by the Contractor. An endorsement should also be added to the policy to cover theft of the City’s money, securities, or other property (third party coverage).</p>
6.	<p>Professional Liability/Errors & Omissions Required when: A. Contractor must maintain a license or special degree. B. Services require high level of expertise or knowledge in a particular field requiring certification or licensing. C. Law enforcement Contractors. (Where applicable, coverage may be provided in the General Liability policy (e.g. wrongful detention or arrest etc.) A and B services (above) typically include engineering and design services, architects, attorneys, physicians, insurance brokers and agents etc., as well as services requiring access to any private information, electronic data, or equipment owned by the City is part of the Work.</p>	<p>\$2,000,000 each claim and aggregate.</p>
X 7.	<p>Excess Liability/Umbrella</p>	<p>\$1,000,000 per Occurrence and Aggregate for bodily injury, property damage, personal and advertising injury, and products and completed operations. Limits should include an aggregate per project for construction projects. Higher limits may be required in some cases.</p>

INVITATION TO BID (ITB) NUMBER 00000531
TAYLOR RUN EXPOSED SEWER PROTECTION PROJECT NUMBER 11-105

	8.	Garage Liability Required when the Contractor takes possession of City owned vehicles including buses in order to repair.	\$1,000,000 bodily injury and property damage for each occurrence/accident.
	9.	Pollution Liability Coverage should be included with a \$1,000,000 limit for each occurrence, claim, or pollution incident. This coverage is required of all Contractors performing any type of hazardous material remediation, working with pollutants including asbestos and lead abatement, or performing underground work. Higher limits may be required in some circumstances.	
X	10.	City of Alexandria must be named as an additional insured on all insurance policies other than Worker's Compensation and Professional Liability and must be stated on the certificate(s) of insurance (or the certified policy, if required.) The Contractor's insurance will be primary and the City's insurance or self-insurance shall be non-contributory. The Contractor shall waive and require their insurers to waive by endorsement subrogation rights against the City for losses and damages incurred under the insurance policies required by the agreement. No work shall be performed by Contractors or subcontractors until a certificate of insurance or other documentation has been submitted and approved by City to insure compliance with all insurance requirements.	
X	11.	Thirty (30) day notice of cancellation, non-renewal, material change, or coverage reduction is required on all policies.	
X	12.	All required insurance coverage shall be acquired from an insurer authorized to do business in the Commonwealth of Virginia and acceptable to the City. The insurer shall have a policyholders' rating of "A-" or better and a financial size of "Class VIII" or better in the latest edition of Best's Insurance Reports, unless the City grants specific approval for an exemption.	
X	13.	The Certificate(s) of Insurance shall state the solicitation number and title.	

Bidder's Name

Bidder's Authorized Signatory

Date

Name and Title of Authorized Signatory

SUBMITTAL C - FORM "A" INSURANCE (continuation sheet)

Bidders shall review this section carefully with their insurance agents prior to Bid submission. Bidders may see the "City of Alexandria Insurance Checklist" for specific coverage requirements applicable to this Contract.

I. Liability Insurance – "Occurrence" Basis:

1. The successful Bidder shall purchase and maintain, in a company or companies authorized to do business in the Commonwealth of Virginia and acceptable to the City, such insurance as will protect the successful Bidder and the City from the claims set forth below, which may arise out of or result from the successful Bidder's operations under the Contract, whether such operations are by the successful Bidder or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:
 - A. Claims under Workers' Compensation, disability benefits, and other similar employee benefit acts;
 - B. Claims for damages because of the bodily injury, occupational sickness or disease, or death of the successful Bidder's employees;
 - C. Claims for damages because of the bodily injury, sickness or disease, or death of any person other than the successful Bidder's employees;
 - D. Claims for damages insured by usual personal injury liability coverage that are sustained by any person as a result of an offense directly or indirectly related to the employment of such person by the successful Bidder or by any other person;
 - E. Claims for damages, other than to the Work itself (but only to the extent of coverage under any Builders' Risk or other property form, if applicable), because of injury to or destruction of tangible property, including loss of use resulting therefrom; and
 - F. Claims for damages because of the bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any owned, hired, or non-owned motor vehicle.

II. Commercial General or other required Liability Insurance – "Claims Made" Basis

If Commercial General or other liability insurance purchased by the successful Bidder has been issued on a "claims made" basis, the successful Bidder shall comply with the following additional conditions. The limits of liability and the extensions to be included as described in the "City of Alexandria Insurance Checklist" remain the same. The successful Bidder shall either:

1. Agree to provide the certificates of insurance evidencing the above coverage for a period of three (3) years after Final Payment for the Contract, which certificates shall evidence a retroactive date no later than the beginning of the successful Bidder's or subcontractors' Work under this Contract; or
2. Purchase a three (3) year extended reporting period endorsement for the policy or policies in force during the term of this Contract and provide evidence of the purchase of this

**INVITATION TO BID (ITB) NUMBER 00000531
TAYLOR RUN EXPOSED SEWER PROTECTION PROJECT NUMBER 11-105**

extended reporting period endorsement by means of a certificate of insurance or a certified copy of the endorsement itself.

Bidder's Name

Bidder's Authorized Signatory

Date

Name and Title of Authorized Signatory

PART IV - REQUIRED SUBMITTAL D REQUIRED INFORMATION FORM

1. Each Bidder submitting a Bid in response to the ITB must provide the following information:

Minority Business Firm:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Small Business Firm:	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Sole Proprietorship:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Partnership:	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Corporation:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Other:	Yes <input type="checkbox"/>	No <input type="checkbox"/>

2. Sole proprietorships and partnerships must provide the following information:

Name _____

Address _____

City, State _____

Partnerships must provide this information for all partners.

3. Corporations must provide the following:

State of Incorporation _____

Charter number of the Virginia certificate of authority _____

Date of Incorporation _____

Foreign corporations desiring to transact business in the Commonwealth of Virginia shall register with the State Corporation Commission in accordance with Code of Virginia § 13.1-757, as amended.

4. Each corporation must provide the names of the following officers:

President: _____

Vice-President: _____

Secretary: _____

Treasurer: _____

Registered Agent: _____

Bidder's Name

Bidder's Authorized Signatory

Date

Name and Title of Authorized Signatory

**PART IV - REQUIRED SUBMITTAL E
CERTIFIED STATEMENT OF NON-COLLUSION FORM**

- A.** This is to certify that the undersigned is seeking, offering, or agreeing to transact business or commerce with the City of Alexandria, a municipal corporation of Virginia, or seeking, offering, or agreeing to receive any portion of the public funds or moneys and that the offer or agreement or any claim resulting therefrom is not the result of or affected by any act of collusion with another person engaged in the same line of business or commerce or any act of fraud punishable under Article 1.1 (Virginia Governmental Frauds Act), Chapter 12 (Miscellaneous), Title 18.2 (Crimes and Offenses Generally) of the Code of Virginia (1950), as amended.
- B.** This is to further certify that the undersigned has read and understands the following:
- (1) The City is authorized by Code of Virginia § 18.2-498.4 (1950), as amended, to require this certified statement. That section also provides that any person required to submit this statement that knowingly makes a false statement shall be guilty of a Class 6 felony.
 - (2) Code of Virginia § 18.2-498.3 (1950), as amended, provides that any person, in any commercial dealing in any matter within the jurisdiction of any local government or any department or agency thereof, who knowingly falsifies, conceals, misleads, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document, knowing the same to contain any false, fictitious, or fraudulent statement or entry, shall be guilty of a Class 6 felony.
 - (3) Code of Virginia § 59.1-68.7 (1950), as amended, provides that any combination, conspiracy, or agreement to intentionally rig, alter, or otherwise manipulate or to cause to be rigged, altered, or otherwise manipulated any bid submitted to any governmental unit for the purpose of allocating purchases or sales to or among persons, raising or otherwise fixing the prices of goods or services or excluding other persons from dealing with the state or any other governmental unit, shall be unlawful. Any person violating the foregoing shall be guilty of a Class 6 felony.

Bidder's Name

Bidder's Authorized Signatory

Date

Name and Title of Authorized Signatory

**PART IV - REQUIRED SUBMITTAL F
DISCLOSURES RELATING TO CITY OFFICIALS AND EMPLOYEES**

A. I hereby state that upon the date of submittal of this Bid (check one):

- () Our firm has **no reason** to believe that any member of the City Council, any official or employee of the City, or any member of any commission, committee, board or other body controlled or appointed by the City Council has already received, in connection with or related in any way to this Contract, or has been promised, in the event this Contract is issued to the firm, any commission, finder's fee, or other thing of value.
- () Our firm **has reason** to believe that the following members of City Council, official(s), or employee(s) of the City, or member(s) of any commission, committee, board, or other body controlled or appointed by City Council has already received, in connection with or related in any way to this Contract, or has been promised, in the event this Contract is issued to the firm, any commission(s), finder's fee(s), or other thing(s) of value:

_____	_____
Name	Title/Position
_____	_____
Name	Title/Position

B. I hereby state that upon the date of submittal of this Bid (check one):

- () Our firm has **no reason** to believe that any member of the City Council or any official or employee of the City would or may be financially affected, whether affirmatively or negatively and whether personally or through a spouse or other family member, if this Contract were issued to the firm.
- () Our firm **has reason** to believe that the following member(s) of the City Council, or official(s) or employee of the City would or may be financially affected, whether affirmatively or negatively and whether personally or through a spouse or other family member, if this Contract were issued to the firm:

_____	_____
Name	Title/Position
_____	_____
Name	Title/Position

Bidder's Name

Bidder's Authorized Signatory

Date

Name and Title of Authorized Signatory

**PART IV - REQUIRED SUBMITTAL G
BIDDER'S PRICING SCHEDULE**

In the spaces below, the Bidder shall submit pricing for the goods and/or services set forth in the ITB and fill in the pricing schedules using US Dollars. Any Bidder, who enters a zero (0), leaves blank, or uses characters on a pricing blank may be deemed nonresponsive.

NOTE: Labor pricing shall be at the fully-burdened labor rate.

Item	Description	Units	Qty	Unit Cost	Total Cost
1	Maintenance of Traffic	LS	1		
2	Temporary Erosion and Sediment Control	LS	1		
3	Site Clearing, Removal and Disposal of Existing Work	LS	1		
4	Sanitary Sewers and Appurtenances (Ductile Iron Pipe)	LF	80		
5	Precast Concrete Manhole and Appurtenance	EA	1		
6	Remove and Replace Curb Gutter. Mill and Pave	LS	1		
7	Remove and Replace Mulch Path	SY	115		
8	Temporary Bypass Pumping System	LS	1		
9	Vinyl Seawall	LS	1		
10	Temporary and Permanent Seeding	LS	1		
11	Metal Fabrications (Pipe Support System)	LS	1		
12	Temporary Access Road	LS	1		
	TOTAL BASE BID				

Bidder's Name

Bidder's Authorized Signatory

Date

Name and Title of Authorized Signatory

**PART IV - REQUIRED SUBMITTAL H
REFERENCE LIST FORM**

The Bidder shall provide below the following information for **all** contracts, projects, or jobs of similar size and scope performed for all customers within the past three (3) years.

Reference 1

1. Contract, project, or job name: _____
2. Organization for which contract, project, or job was performed: _____
3. Date(s) of contract, project, or job: _____
4. Dollar Value of contract, project, or job: _____
5. Contact information of the organization for which the contract, project, or job was performed:

Contract Manager (or other representative): _____ Title: _____

Telephone Number: _____ Email: _____

Address: _____

Reference 2

1. Contract, project, or job name: _____
2. Organization for which contract, project, or job was performed: _____
3. Date(s) of contract, project, or job: _____
4. Dollar Value of contract, project, or job: _____
5. Contact information of the organization for which the contract, project, or job was performed:

Contract Manager (or other representative): _____ Title: _____

Telephone Number: _____ Email: _____

Address: _____

Reference 3

1. Contract, project, or job name: _____
2. Organization for which contract, project, or job was performed: _____
3. Date(s) of contract, project, or job: _____
4. Dollar Value of contract, project, or job: _____
5. Contact information of the organization for which the contract, project, or job was performed:

Contract Manager (or other representative): _____ Title: _____

Telephone Number: _____ Email: _____

Address: _____

Reference 4

1. Contract, project, or job name: _____
2. Organization for which contract, project, or job was performed: _____
3. Date(s) of contract, project, or job: _____
4. Dollar Value of contract, project, or job: _____
5. Contact information of the organization for which the contract, project, or job was performed:

Contract Manager (or other representative): _____ Title: _____

Telephone Number: _____ Email: _____

Address: _____

***Please attach additional pages as required.**

PART IV - REQUIRED SUBMITTAL I
W-9 Request for Taxpayer Identification Number and Certification

Please complete and returned the attached W-9 on the following page.

Request for Taxpayer Identification Number and Certification

**Give Form to the
requester. Do not
send to the IRS.**

Print or type See Specific Instructions on page 2.	Name (as shown on your income tax return)	
	Business name/disregarded entity name, if different from above	
	Check appropriate box for federal tax classification: <input type="checkbox"/> Individual/sole proprietor <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <input type="checkbox"/> Other (see instructions) ▶ _____	Exemptions (see instructions): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____
	Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	City, state, and ZIP code	
	List account number(s) here (optional)	

Part I Taxpayer Identification Number (TIN)																					
Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see <i>How to get a TIN</i> on page 3.																					
	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <th colspan="10" style="text-align: left; padding: 2px;">Social security number</th> </tr> <tr> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> </tr> </table>	Social security number																			
Social security number																					
Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <th colspan="9" style="text-align: left; padding: 2px;">Employer identification number</th> </tr> <tr> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> <td style="width: 30px; height: 25px;"></td> </tr> </table>	Employer identification number																			
Employer identification number																					

Part II Certification			
Under penalties of perjury, I certify that:			
1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and 2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and 3. I am a U.S. citizen or other U.S. person (defined below), and 4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.			
Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.			
Sign Here	<table style="width: 100%;"> <tr> <td style="width: 70%; border-bottom: 1px solid black;">Signature of U.S. person ▶</td> <td style="width: 30%; border-bottom: 1px solid black;">Date ▶</td> </tr> </table>	Signature of U.S. person ▶	Date ▶
Signature of U.S. person ▶	Date ▶		

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. The IRS has created a page on IRS.gov for information about Form W-9, at www.irs.gov/w9. Information about any future developments affecting Form W-9 (such as legislation enacted after we release it) will be posted on that page.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, payments made to you in settlement of payment card and third party network transactions, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

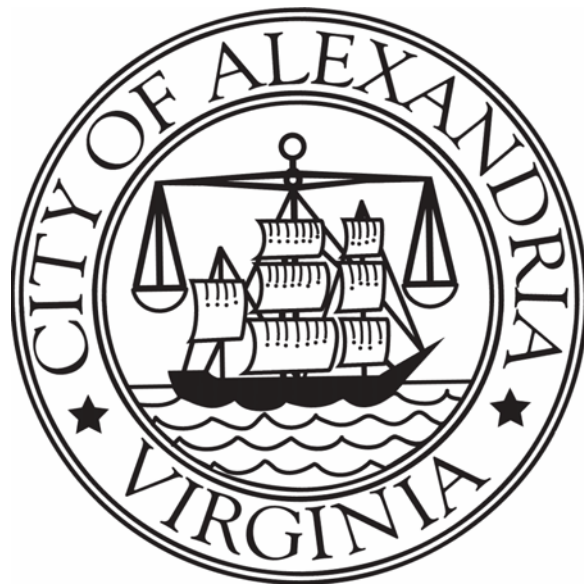
- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

**CITY OF ALEXANDRIA
TAYLOR RUN EXPOSED SEWER PROTECTION
PROJECT NO. 11-105**

ISSUE DATE: _____

TECHNICAL SPECIFICATIONS



TAYLOR RUN EXPOSED SANITARY SEWER PROTECTION

TECHNICAL SPECIFICATIONS

Taylor Run Exposed Sewer Protection 11-105

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SECTION 01000

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all Work included in this Contract. The summary of the work is presented in Division 1 Section "Summary."
- B. The Work consists of the following:
 - 1. The Contractor shall furnish all labor, superintendence, quality control, materials, power, light, heat, fuel, water, tools, appliances, equipment, supplies, and other means of construction necessary or proper for performing and completing the Work. He shall perform and complete the Work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Director of Transportation and Environmental Services (T&ES), and in strict accordance with the Contract Documents. The Contractor shall clean up the Work and maintain it during and after construction, until accepted, and shall do all work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the Work.
 - 2. The cost of incidental work shown on the plans, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made therefore.
 - 3. The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the City Engineer, to perform in a satisfactory and acceptable manner all the work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials and equipment, prior approval of the City Engineer notwithstanding.
 - 4. The Contractor shall perform all work in accordance with applicable local, state, and federal codes and regulations.
- C. Public Utility Installations and Structures:
 - 1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, vaults, manholes, and all other appurtenances and facilities pertaining thereto whether owned or controlled by the Owner (City of Alexandria), other governmental bodies or privately owned, used to provide gas, electricity, telephone, sewerage, drainage, water or other public or private property which may be affected by the work shall be deemed included hereunder.

2. The Contract Documents contain data relative to existing public or private utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition and extent of all such installations and structures as may be encountered and as may affect the construction operations.
3. The Contractor shall protect all public or private utility installations and structures from damage during the work. Access across any buried installation or structure shall be made only in such locations and by means approved by the Utility Owner. The Contractor shall so arrange his operations as to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing utilities damaged by the Contractor shall be repaired by the Contractor, at his expense, as directed by the Utility Owner. No separate payment shall be made for such protection or repairs to public utility installations or structures.
4. Where public utility installations or structures owned or controlled by the Owner (City of Alexandria) or other governmental body are encountered during the course of the work, and are not indicated on the Plans or in the Specifications, and when, in the opinion of the City Engineer, removal, relocation, replacement or rebuilding is necessary to complete the work under this Contract, such work shall be accomplished by the utility having jurisdiction, or such work may be approved, in writing by the City Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be in accordance with the General and Supplemental General Conditions.
5. All Owners (City of Alexandria) and other governmental utility departments and other Owners of public utilities which may be affected by the work will be informed in writing by the Contractor within two weeks after the execution of the Contract or Contracts covering the work. Such notice will set out, in general, and direct attention to the responsibilities of the Owner (City of Alexandria) and other governmental utility departments and other Owners of public utilities for such installations and structures as may be affected by the work and will be accompanied by one set of Plans and Specifications covering the work under such Contract(s).
6. In addition to the general notice given, the Contractor shall give written notice to Owner (City of Alexandria) and other governmental utility departments and other Owner of public utilities of the location of his proposed construction operations, at least one (1) week in advance of breaking ground in any area or on any unit of the work. This can be accomplished by making the appropriate contact with the Miss Utility of Virginia "one-call" center.
7. The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the Utility Owner at no additional cost.

1.2 PLANS AND SPECIFICATIONS

A. Plans:

1. Definition: "Plans" or "Drawings" as discussed within these Specifications are interchangeable terms for the same.
2. When obtaining data and information from the Plans, figures shall be used in preference to scaled dimensions, and large scale drawings in preference to small scale drawings.

B. Copies Furnished to Contractor:

1. After the Contract has been executed, the Contractor will be furnished with three sets of paper prints, and three copies of the Specifications. Additional copies of the Plans and Specifications, when requested, may be furnished to the Contractor at cost of production.
2. The Contractor shall furnish each of the subcontractors, manufacturers, and material suppliers such copies of the Contract Documents as may be required for their work.

C. Supplementary Drawings:

1. When, in the opinion of the City Engineer, it becomes necessary to explain more fully the work to be done or to illustrate the work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the City Engineer and four paper prints thereof will be given to the Contractor

D. Contractor to Check Plans and Data:

1. Contractor shall verify all dimensions, quantities and details shown on the Plans, Supplementary Drawings, Schedules, Specifications or other data received from the City Engineer, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting there from nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the City Engineer, should such errors or omissions be discovered. All schedules are given for the convenience of the City Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract.

1.3 TEMPORARY STRUCTURES

A. Responsibility for Temporary Structures

1. In accepting the Contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation and will indemnify and save harmless the Owner (City of Alexandria) and City Engineer, Owner's Consultants from all claims, suits or actions and damages or costs of every description arising by reason of failure to comply with the above provisions.

B. Temporary Fences

1. If, during the course of the work, it is necessary to remove or disturb any fence or part thereof, the Contractor shall, at his own expense, if so approved by the City Engineer, provide a suitable temporary fence which shall be maintained until the permanent fence is replaced. The City Engineer shall be solely responsible for the determination of the necessity for providing a temporary fence and the type of temporary fence to be used.

1.4 SAFETY

A. Accident Prevention

1. Precautions shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, building and construction codes shall be observed. The Contractor shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), and under Section 107 of the contract Work Hours and Safety Standards Act (PL-54), except where state and local safety standards exceed the federal requirements and except where state safety standards have been approved by the Secretary of Labor in accordance with provisions of the Occupational Safety and Health Act.

B. First Aid

1. The Contractor shall keep upon the site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when people are employed on the work.

1.5 LINES AND GRADES

A. Grade

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Plans, or as approved by the City Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.

B. Safeguarding Marks

1. The Contractor shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the work, bear the cost of reestablishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes and marks.
2. The Contractor shall safeguard all existing and known property corners, monuments and marks adjacent to but not related to the work and, if required, shall bear the cost of reestablishing them if disturbed or destroyed.

1.6 ADJACENT STRUCTURES AND LANDSCAPING

A. Responsibility

1. The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the work, whether or not shown on the Plans, and the removal, relocation and reconstruction of such items called for on the Plans or specified shall be included in the various Contract Items and no separate payments will be made therefore.
2. Contractor is expressly advised that the protection of buildings, structures, pipelines, etc. and related work adjacent and in the vicinity of his operations, wherever they may be, is solely his responsibility.
3. Contractor shall, before starting operations, make an examination of adjacent structures, buildings, facilities, etc., and record by notes, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the Director of Transportation & Environmental Services and City Engineer. This does not preclude conforming to the requirements of the insurance underwriters. Copies of surveys, photographs, reports, etc., shall be submitted to the City Engineer.
4. Prior to the beginning of any excavations the Contractor shall advise the City Engineer of all buildings or structures on which he intends to perform work or which performance of the project work will affect.

B. Protection of Trees

1. All trees and shrubs shall be adequately protected by the Contractor in accordance with the City of Alexandria's Ordinances which governs the protection of trees. Contractor shall also comply with the provisions of the Division 2 Section "Site Preparation."

C. Lawn Areas

1. Project site areas shall be left in as good condition as before the starting of the work. Where sod is removed, it shall be carefully removed, and later replaced with same or like kind. Contractor shall also comply with the provisions of the Division 2 Section "Lawns and Grasses."

1.7 PROTECTION OF WORK AND PUBLIC

A. Barriers and Lights

1. During the prosecution of the work, the Contractor shall put up and maintain at all times such barriers and lights as will effectually prevent accidents. The Contractor shall provide suitable barricades, lights, "danger" or "caution" signs at all places where the work causes obstructions or constitutes in any way a hazard to the public in accordance with state and local requirements.

B. Smoke Prevention

1. The Contractor shall use hard coal, coke, oil or gas as fuel for equipment generating steam. A strict compliance with ordinances regulating the production and emission of smoke will be required. No open fires will be permitted.

C. Noise

1. The Contractor shall eliminate noise to as great an extent as practicable at all times. Air compressing plants shall be equipped with silencers and the exhaust of all gasoline motors or other power equipment shall be provided with mufflers. The Contractor shall strictly observe the City of Alexandria Noise Control Code, Title II, and Chapter 5.
2. Except in the event of an emergency, work shall be done within the regular working hours specified in the City of Alexandria Noise Control Code, Title II, and Chapter 5. If the proper and efficient prosecution of the work requires operations outside of these hours, the written permission of the Director of Transportation & Environmental Services must be obtained.

D. Access to Public Services

1. Neither the materials excavated nor the materials or plant used in the construction of the work shall be so placed as to prevent free access to all fire hydrants, valves or manholes, or access required by emergency vehicles and/or personnel.

1.8 CLEANING

A. During Construction

1. During construction of the work, the Contractor shall, at all times, keep the site of the work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the City Engineer, such material, debris, or rubbish constitutes a nuisance or is objectionable.
2. The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops.
3. The Contractor shall be responsible and liable for all spillage and incur all associated costs including, but not limited to, costs related to repair and maintenance resulting from damages thereof.

B. Final Cleaning

1. At the conclusion of the work, all erection plant, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.
2. The Contractor shall thoroughly clean all piping and materials installed by him prior to final inspection.

1.9 MISCELLANEOUS

A. Protection against Siltation and Bank Erosion

1. The Contractor shall arrange his operations to minimize siltation on construction sites.
2. The Contractor, at his own expense, shall remove any siltation deposits and correct any erosion problems as determined by the City Engineer which results from his construction operations.
3. The Contractor shall vacuum clean all new and existing storm drainage facilities and discharge points affected by construction prior to final acceptance by the Director of Transportation & Environmental Services.

B. Protection of Wetland Areas

1. The Contractor shall properly dispose of all surplus material, including soil, in accordance with Local, State and Federal regulations. Under no circumstances shall surplus material be disposed of in wetland areas as defined by the Virginia Department of Environmental Quality.

C. Existing Facilities

1. The work shall be so conducted to maintain existing facilities in operation insofar as is possible. Requirements and schedules of operations for maintaining existing facilities in service during construction shall be as described in these Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 GENERAL

- A. Construction Documents: Execution of the Works shall be governed by these following documents, in whole or in part as applicable:
 1. Contract Drawings
 2. Specifications:
 - a. Project Specifications
 - B. Virginia Department of Transportation, Road and Bridge Specifications, 2007 (VDOT Specifications)
 3. Standard Details:
 - a. City of Alexandria, VA, Department of Transportation & Environmental Services, Design and Construction Standards, July 1989 (City Standards)
 - b. Virginia Department of Transportation, Road and Bridge Standards, Volumes I & II, 2008 with latest Revisions (VDOT Standards)
 - c. Virginia Erosion and Sediment Control Handbook, Third Edition, 1992 (VESCH)
- B. Order of Precedence: In case of discrepancy between Specifications and Drawings, the Specifications shall govern over Drawings. In case of discrepancy between Specifications and in case of discrepancy between Standards, order of precedence for specifications and standards shall be as follows:
 1. For conflicts between Contract Specifications, the Project Specifications shall govern over VDOT Specifications.
 2. For requirements not specified in the Project Specifications, VDOT Specifications shall govern.
 3. For conflicts between Contract Standards, the City Standards shall govern over the VESCH. The VESCH shall govern over VDOT Standards.
- C. In case of discrepancy in the figures, in the Drawings or in the Specifications, the matter shall be promptly submitted to the City Engineer who shall promptly make a determination in writing.

- D. Project Construction Schedule: The Contractor is advised that an integral part of the project will be a construction schedule. Within 10 days of Notice-To-Proceed, the Contractor shall submit to the City the critical path method construction schedule. The schedule is to include material ordering and lead times as well as installation by Contractor. Construction schedules will be reviewed for activity logic, but it is the Contractor's sole responsibility to accomplish the work within the contract completion date.
- E. Hours of Operation: All work shall be carried out between the hours of 7:00AM and 6:00 PM, Monday thru Friday, and 9:00AM and 6:00PM, on Saturdays. For work to be done at night, the contractor has to get approval from the City of Alexandria.
- F. Permits: The Contractor shall be responsible for obtaining all necessary permits to work in the City's right of way.

+ + END OF SECTION + +

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SECTION 01011

SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION AND SCOPE OF WORK

- A. The Project consists of one prime contract for installation of 76 feet of 18-inch Ø Class 53 Ductile Iron Pipe sanitary sewer, 1 manhole using conventional open trench construction, and 60 feet of vinyl sheet wall.
- B. The Project is located in the Taylor Run channel approximately 100 feet, behind Chinquapin Recreation Center near Chinquapin Dr. and King St.
- C. The summary of the Work described in this Section is an overall summary of the responsibilities of the CONTRACTOR and the CONTRACTOR's relationship to the OWNER. It does not supersede the specific requirements of the other Contract Documents.
- D. In addition to the standards included in these Contract Documents, all work shall comply with the following:
 - 1. City of Alexandria Department of Transportation and Environmental Services Design and Construction Standards, latest revision.
 - 2. Virginia Department of Environmental Quality.
- E. CONTRACTOR's attention is directed to the requirements of the Sections of Division 1 - General Requirements. These general requirements complement the related specific work specified in Division 2 through Division 16 although Division 1 Sections are not directly referenced in the Sections of Division 2 through Division 16. All requirements of Division 1 through Division 16 are binding on the CONTRACTOR and are not exclusive of each other. ENGINEER shall resolve all disputes and provide clarifications and interpretations as stated in Article 9 of the General Conditions.

PART 2 – PRODUCTS

The intent of these specifications is to describe the replacement of portions of the sanitary sewer system utilizing conventional open trench construction methods for mainline sewer.

PART 3 - EXECUTION

3.1 SCOPE OF WORK

- A. The Work shall include the installations of all of the sewer mains and manholes and the full restoration of all areas disturbed in the process of performing the Work. In addition, the Work shall include the reconnection of all services to the main including testing and documentation of full service restoration for all connections.
- B. The work shall include, but not be limited to, the following:

1. Confirmation testing & documentation of full service restoration;
 2. Full restoration of all disturbed areas;
 3. Post-installation video inspection/documentation;
 4. Post-installation manhole testing;
 5. Post-installation testing for water-tightness.
- C. CONTRACTOR shall coordinate with all affected utilities to assure that crossings are located and they may present as required.
- D. The successful bidder is responsible for field verification of all information as needed.

++ END OF SECTION ++

SECTION 01046

CONNECTIONS TO EXISTING FACILITIES

PART 1 – GENERAL

1.1 GENERAL

- A. Perform all construction necessary to complete connections and tie ins to ex. facilities.
- B. Keep existing facilities in operation unless otherwise specifically permitted by OWNER.
- C. All CONTRACTOR's shall perform all construction activities so as to avoid interference with operations of OWNER's facilities and the work of others.
- D. It is the responsibility of each CONTRACTOR to maintain continuous operation of existing facilities while working in, on or around these facilities. Each CONTRACTOR shall protect the existing facilities by any means required including sheeting, shoring, bracing, patching, temporary piping, etc., however all means shall comply with OWNER's minimum standards.

1.2 BYPASSING

- A. All facilities must remain in operation at all times unless otherwise permitted by OWNER. Bypassing of sewage out of the City of Alexandria sanitary sewer system is strictly prohibited. All bypasses involving sewage must return sewage to the City of Alexandria sanitary sewer system without allowing the sewage to enter the environment. CONTRACTOR shall be liable for all costs and fines resulting from release of sewage out of the City of Alexandria sewer system.
- B. If a bypass is required to complete certain segments of Work or to make a tie-in, the CONTRACTOR shall be responsible for all methods, means and costs including provision of all necessary labor and materials to perform the operation.
- C. Unless otherwise specifically permitted or approved by the OWNER, no interruption in service will be permitted during bypasses or tie-ins.

1.3 SUBMITTALS

- A. A detailed bypass pumping plan must be submitted for approval.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

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SECTION 01201

PRECONSTRUCTION CONFERENCE

PART 1 - GENERAL

1.1 SCOPE

- A. Date, Time and Location: Conference will be held after execution of the Agreement and before construction is started at the site. The ENGINEER will fix the date, time and location of the meeting in accordance with the General Conditions.
- B. The ENGINEER shall prepare agenda, preside at meeting, and prepare and distribute a transcript of proceedings to all parties.
- C. All prime CONTRACTORS shall provide data required, contribute appropriate items for discussion, and be prepared to discuss all items on agenda.

1.2 REQUIRED ATTENDANCE

- A. CONTRACTOR(S) and major Subcontractors.
- B. ENGINEER.
- C. ENGINEER's Consultants.
- D. Representatives of governmental agencies and utilities having any degree of regulatory authority, control or responsibility, if available.

1.3 AGENDA

- A. Agenda will include, but will not necessarily be limited to, the following:
 - 1. Project Administration:
 - a. Designation of responsible personnel. List all names, titles, affiliations, work phone numbers and emergency phone numbers.
 - b. Role of OWNER and ENGINEER in supervising project.
 - c. Define communication flow.
 - 2. Status of Contracts:
 - a. Agreements executed.
 - b. Bonds submitted and approved.
 - c. Notice to proceed.
 - d. Establish completion date.

3. Subcontractors.
4. Coordination with OWNER's operations.
5. Construction schedule.
6. Processing of Shop Drawings.
 - a. Discuss submission of samples.
7. Schedule of Shop Drawing submittals.
8. Testing:
 - a. Frequency and schedule of field tests; equipment, pipe, etc.
 - b. Frequency and schedule of material tests; concrete, soil, compaction, etc.
9. Processing of Field Orders and Amendments.
10. Requirements for copies of Contract Documents.
11. Schedule of values.
12. Record Documents:
 - a. CONTRACTOR to keep record drawing set current at site and available to Inspector, ENGINEER, OWNER, etc.
 - b. CONTRACTOR to deliver record set at end of project.
 - c. CONTRACTOR shall be responsible for record drawing information.
13. CONTRACTOR's responsibility for safety and first aid procedures.
CONTRACTOR to provide list of all emergency contacts and phone numbers.
14. Security:
 - a. Review approved Security Plan (if required by Section S-01540).
 - b. Identify effective dates of Security Plan.
 - c. Identify personnel (OWNER, CONTRACTOR, subcontractor, etc.) authorized to enter project site.
 - d. Identify site entrance points and exit points if applicable.
15. Use of premises.
16. Clean-up/housekeeping considerations.
 - a. Daily clean-up is required in Section 01710.
17. Utility Considerations:
 - a. Coordination with Electric Utilities.
 - b. Coordination with Water Utilities.
 - c. Future utilities that must cross site.
 - d. Coordination with Telephone, Gas, Cable, etc.
18. Staking and Layout:

- a. Reference points, benchmarks provided by OWNER.
- b. Method of staking and layout to be employed by CONTRACTOR.
- c. Discuss staking and clearing procedures.
- d. Anticipated schedule for clearing procedures.

19. Earthwork excavation:

- a. Plan for compliance with OSHA standards (see Section 02221 for references, submittals, etc.).
- b. Trench excavations impacting streets, driveways and roadways must be completed as stated in Section 02221.
- c. Cut/Fill balance.
- d. Submission of materials from another site, approval of site.
- e. Discharge of dewatering flows (See Section 02221).
- f. Debris removal.

20. Utilization of the site for storage, vehicle parking, access routes and other site requirements.

21. Required Permits:

- a. Earthmoving; ODNR permits.
- b. Roadway permits.
- c. Other permits.

22. Proposed haul routes, access routes, traffic control plans, etc.

23. Stream Protection Measures (if applicable):

- a. Impacts of site utilization (Item 25) and traffic/haul concerns (Item 27).
- b. Protection of vegetation, trees, etc.
- c. Proposed stream crossing construction plan.
- d. Proposed temporary culverts, bridges, etc., if any.
- e. Restoration procedures, staged to minimize impact.
- f. Other issues as necessary.

24. Progress meetings

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

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SECTION 01270

UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.

1.2 DEFINITIONS

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, applicable quality control tests, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for Each item of work.
- C. Cost of quality control work shall be considered as part of the general cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made therefore.
- D. Owner (City of Alexandria) reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's (City of Alexandria) expense, by an independent surveyor acceptable to Contractor.
- E. The City shall have the right to increase or decrease the volume of work by 25% of the total bid price without any changes in the bid unit prices.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 MEASUREMENT AND PAYMENT

1. Maintenance of Traffic

- A. Maintenance of Traffic measurement shall be lump sum.

- B. Payment shall include full compensation for all labor, material, and equipment necessary for installing, maintaining, operating and removing traffic control devices and systems.
- 2. Temporary Erosion and Sediment Control
 - A. Temporary Erosion and Sediment control measurement shall be lump sum.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary for installing temporary erosion and sediment control measures including: matting and seeding, super silt fence, tree protection, diversion dike, inlet protection, and stabilized construction entrance.
- 3. Site Clearing, Removal and Disposal of Existing Work
 - A. Site Clearing, Removal, Demolition and Disposal of Existing Work shall be lump sum.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary for site clearing, removal and demolition of existing work including: removal of concrete, riprap, sewer, pipes, walls, gabions, trees, stumps, stone, clearing, grubbing, disposal of waste material and all other site clearing activities.
- 4. Sanitary Sewers and Appurtenances
 - A. Sanitary Sewers and Appurtenances shall be measured in linear feet measured along the center of the pipeline.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary for constructing sanitary sewers and appurtenances including: excavating, backfilling, testing and placing the pipe into operation.
- 5. Precast Concrete Manholes and Appurtenances
 - A. Precast Concrete Manholes and Appurtenances shall be measured per each manhole.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary for installing, testing and placing the manhole into operation.
- 6. Remove & Replace Curb & Gutter
 - A. Remove and Replace Curb & Gutter shall be measured in Lump Sum.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary to remove and replace curb and gutter including: breaking, removal and disposal of concrete, as well as milling and paving any areas damaged during construction.
- 7. Remove and Replace Mulch Path
 - A. Remove & Replace Mulch Path shall be measured in Square Yards.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary to remove and construct mulch path including; breaking, removal and disposal of mulch

path including base soil up to a total depth of 8 inches.

8. Temporary Bypass Pumping Systems
 - A. Temporary Bypass Pumping Systems shall be measured in lump sum.
 - B. Payment shall include full compensation for all labor, equipment and materials necessary for installing temporary bypass pumping station including: moving, removing and maintaining the Temporary Bypass Pumping systems and all incidental work.
9. Vinyl Seawall
 - A. Vinyl Seawall shall be measured in Lump Sum.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary to install the vinyl seawall, including backfilling to existing grade, installing timber support piles and tie-rods, and pipe penetrations.
10. Temporary and Permanent Seeding.
 - A. Temporary and Permanent Seeding shall be measured in lump sum.
 - B. Payment for this item shall be full compensation for all labor, material and equipment for temporary and permanent seeding including fertilizer, mulch, watering, maintenance, replacement, and all other items required for or incidental to satisfactory completion of the temporary and permanent seeding.
11. Metal Fabrications (Pipe Support System)
 - A. Metal Fabrications (Pipe Support System) shall be measured in lump sum.
 - B. Payment shall include full compensation for all submittals, materials, tools, equipment, labor, and incidentals necessary to complete the work as shown on the plans.
12. Temporary Access Road
 - A. Temporary Access Road shall be measured in lump sum.
 - B. Payment shall include full compensation for all labor, material, and equipment necessary to construct the temporary access road.

++ END OF SECTION ++

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SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall submit to the Engineer for review and approval such shop drawings, test reports and product data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of work, including but not limited to those shop drawings product data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.
- B. Within thirty (30) days after the effective date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary data on items for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. The procedure is required in order to expedite final review of Shop Drawings.
- C. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and the Engineer. This log should include the following items:
 - 1. Submittal-Description and Number assigned.
 - 2. Date Submitted to Engineer.
 - 3. Date returned to Contractor (from Engineer).
 - 4. Status of Submittal (Approved, Approved as Noted, Revise and Return, Rejected).
 - 5. Date of Resubmittal and Return (as applicable).
 - 6. Date material release (for fabrication).
 - 7. Projected date of fabrication.
 - 8. Projected date of delivery to site.
 - 9. Status of O&M manuals submittal.
 - 10. Specification Section.
 - 11. Drawings Sheet Number.

1.2 TYPES OF SUBMITTALS

- A. Shop drawings for manufactured or fabricated items, pipe layout or other schedules,

diagrams and like material prepared specially for this project.

- B. Product Data which include pre-printed material, manufacturer's descriptive literature, illustrations, catalog data, performance charts and the like intended to identify a part of the work but not necessarily prepared exclusively for this Contract.
- C. Samples which include physical examples of products, materials, assemblies or workmanship which are identical to a portion of the work and which establish standards for materials, workmanship, or appearance of the finished work.
- D. Administrative data to include information required to support the administrative requirements of the contract as called for in the specifications.

1.3 PROCEDURE FOR SUBMITTALS

- A. Except where specifically stated otherwise all submittals shall be made to the Engineer for his approval. Submittals of all but administrative data shall be made in at least six copies. Three copies of the submittal will be retained by the Engineer and the other copies returned to the Contractor. Submittals shall be complete for each component of work or system and shall include all inter-related portions of a system. At the completion of the project, the Contractor shall furnish the Engineer one revised record copy as described in Paragraph 1.06.
- B. Administrative data shall be submitted in triplicate (3 copies).

1.4 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the Drawings and data shall bear Contractor's stamp showing that they have been checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents.
- B. Engineer's Contract Drawings shall not be reproduced for the purpose of making shop drawings.
- C. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with Specifications.

- D. The Contractor shall furnish the Engineer a schedule of Shop Drawings submittals fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those submittals that are critical to the progress schedule.
- E. The Contractor shall ensure that no work is begun on any item of work requiring an approved submittal until such approval is obtained.
- F. The Contractor shall not begin any of the work covered by a drawing, data, or a sample returned marked "REVISE AND RETURN" OR "REJECTED" until a revision or correction thereof has been reviewed and returned to him, by the Engineer, with approval.
- G. One approved copy of all submittals shall be held by the Contractor at the construction site.
- H. Each submittal shall be assigned a sequential number by the Contractor, for purposes of easy identification, and shall retain its assigned number with appropriate subscript, on required resubmissions. The assigned number shall consist of the specification section number where the item is specified, followed by a sequential number indicating the number of submittals in that Section (e.g., 03300-11 is the 11th separate submittal for items specified in Section 03300). Resubmittals shall be identified with the same number as the original submittal, followed by the subscript R1, R2, etc. All products and materials submitted shall be clearly identified with the appropriate equipment name and number as it appears in the Contract Document.
- I. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no less than 30 calendar days for reviewing and appropriate action from the time the Engineer receives them.
- J. All submittals shall be accompanied with a transmittal letter prepared in duplicate containing the following information:
 - 1. Date.
 - 2. Project Title and Number.
 - 3. Contractor's name and address.

4. The Number of each Shop Drawing, Project Data, and Sample submitted.
 5. Notification of Deviations from Contract Documents.
 6. Submittal Log Number conforming to Specification Section Numbers.
- K. The Contractor shall submit at least six (6) copies of shop drawing submittals to the Engineer, three of which will be returned to the Contractor.
- L. The Contractor shall be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review by Engineer of the necessary Shop Drawings.
- M. The Contractor shall be fully responsible for observing the need for and making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment he proposed to supply both as pertains to his work and any work affected under other parts, heading, or divisions of drawings and specifications at no cost to the Owner.

1.5 ENGINEER'S REVIEW OF SHOP DRAWINGS

- A. The Engineer's review of drawings, data and samples submitted by the Contractor will be only for conformance with the design concept of the Project and for general compliance with the information given in the Contract Documents. The Engineer's review and approval will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.
- B. The review of drawings and schedules will be general, and shall not be construed:
1. as permitting any departure from the Contract requirements;
 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
 3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.
 4. as approving Contractor's means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto.
- C. If the drawings or schedules as submitted describe variations and show departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting and exception.

- D. When reviewed by the Engineer, each of the Shop Drawings will be identified as having received such review being so stamped and dated. Shop Drawings stamped "REVISE AND RESUBMIT" and with required corrections shown will be returned to the Contractor for correction and resubmittal.
- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.
- F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.
- G. Shop drawings and submittal data shall be reviewed by the ENGINEER for each original submittal and first resubmittal; thereafter review time for subsequent resubmittals will be charged to the CONTRACTOR at the rate of \$75 per hour.
- H. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
- I. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items for:
 - 1. Systems
 - 2. Processes
 - 3. As indicated in specific specifications sections.

1.6 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "Shop Drawings" shall be all drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams, and other information prepared by a Supplier and submitted by Contractor to illustrate material or equipment for some portion of the Work.
- B. Manufacturer's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data shall be CLEARLY MARKED TO IDENTIFY PERTINENT MATERIALS, PRODUCT OR MODELS. Delete information which is not applicable to the Work by striking or cross-hatching.

- C. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.
- D. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the CONTRACTOR SHALL DESCRIBE SUCH VARIATIONS IN HIS LETTER OF TRANSMITTAL. The transmittal letter shall delineate compliance and exceptions taken to Specifications and Contract Drawings. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.
- E. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.
- F. For all mechanical equipment furnished, the Contractor shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.
- G. Only the Engineer will utilize the color "red" in marking Shop Drawing submittals.
- H. Before the final payment is made, the Contractor shall furnish to Engineer one (1) set of record shop drawings all clearly revised, complete and up to date showing the permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, yard piping, electrical system and instrumentation system.

1.7 MIX DESIGNS

Mix designs shall be submitted for concrete, grout, and bituminous paving. Mix design shall indicate all materials used in the product and their respective relative quantities. In any one mix design all quantities shall be expressed either by weight or volume insofar as it is practical to do so. All cast-in-place concrete shall be Class A3 in accordance with Section 217 - Hydraulic Cement Concrete of the Virginia Department of Transportation's "Road and Bridge Specifications", dated January 1994. All precast concrete shall be Class A4 in accordance with Section 217 of the Virginia Department of Transportation's "Road and Bridge Specifications", dated January 1994.

1.8 DESIGN CALCULATIONS

Design calculations shall be presented in a neat, legible manner and shall bear the stamp and signature of a registered professional engineer, registered in the State of Virginia.

1.9 MILL TEST REPORTS

Mill test reports shall be submitted for structural steel and concrete reinforcement steel. Reports shall be on the mill's standard report form.

1.10 RECORD DRAWINGS

The Contractor will keep one copy of all Specifications, Drawings, Addenda, Change Orders and Shop Drawings in the field office at the site, in good order and annotated to show all changes made during the construction process. These shall be available to the Engineer and shall be delivered to him upon completion of the project. If the Contractor fails to maintain the record drawings as required herein, final payment with respect to the Contract as a whole, will be withheld until proper record drawings have been furnished to the Engineer.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

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SECTION 01315

CPM SCHEDULES AND REPORTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The Work under this Contract shall be planned, scheduled, executed, reported and accomplished using the Critical Path Method (hereinafter referred to as CPM), in calendar days, unless otherwise specifically provided in the Contract Documents.
- B. The primary objectives of the CPM scheduling requirements are: (1) to insure adequate planning and execution of the Work by Contractor; (2) to assist Owner in evaluating progress of the Work; (3) to provide for optimum coordination by the Contractor of his trades, Subcontracts and Suppliers, and of his work with the work or services provided by separate contractors; (4) to permit the timely prediction or detection of events or occurrences which may affect the timely prosecution of the Work; and (5) to provide a mechanism or tool for use by the Owner and Contractor in determining and monitoring any actions of the Contractor which may be required in order to comply with requirements of the Contract Documents relating to the completion of the various portions of the Work by the Milestone Dates specified in the Contract Documents.
- C. Contractor is responsible for determining the sequence of activities, the time estimates of the detailed construction activities and the means, methods, techniques and procedures to be employed. The Construction Schedule shall represent the Contractor's best judgement of how he will prosecute the Work in compliance with the Contract requirements. Contractor shall ensure that the Construction Schedule is current and accurate and is properly and timely monitored, updated and revised as Project conditions and the Contract Documents may require.
- D. Contractor shall consult with his principal Subcontractors and Suppliers relating to the preparation of his construction plan and Construction Schedule. Principal Subcontractors shall receive copies of those portions of Contractor's Construction Schedule which relates to their work and shall be continually advised of any updates or revisions to the Construction Schedule as the Work progresses. When Contractor submits his Construction Schedule or makes any proposed updates or revisions to such Schedule, it will be assumed by Owner that Contractor has consulted with and has concurrence of his principal Subcontractors and Suppliers. Contractor shall be solely responsible for ensuring that all Subcontractors and Suppliers comply with the requirements of the Construction Schedule for their portions of the Work.
- E. Contractor will provide the basic data relating to activities, durations and sequences as

- part of the Construction Schedule. This data shall reflect the Contractor's actual construction plan for the Project, and shall fully comply with all requirements of the Contract Documents.
- F. When there are separate contractors working concurrently on the Project whose work must interface or be coordinated with the Work of Contractor, Contractor shall coordinate his activities of the separate contractors and shall, prior to the submission of his Construction Schedule, obtain written approval of his Construction Schedule by the separate contractors. If Contractor is unable to obtain such written approval by the separate contractors after his best efforts to do so, or if a conflict occurs that cannot be resolved by mutual agreement between Contractor and any separate contractor, the Owner shall make a determination of the schedule which will be binding upon Contractor and the separate contractors.
- G. It is understood and agreed that the Construction Schedule is to represent Contractor's best plan and estimate for the work; however, Contractor acknowledges that the Construction Schedule may have to be revised from time-to-time as progress proceeds. Contractor further acknowledges and agrees that the Owner does not guarantee that: (1) Contractor can start work activities on the "early start" or "late start" dates or complete work activities on the "early finish" or "late finish" dates shown in the schedule, or as same may be updates or revised; (2) Contractor can proceed at all times in the sequence established by the utilization of only the resources and manpower he initially plans for the performance of the Work; (3) Contractor's Construction Schedule will not have to be modified in order to obtain the agreement of any separate contractors to the schedule; or (4) Contractor's Construction Schedule will not have to be modified or changed by direction of the Construction Manager. Any changes, modifications or adjustments made by the Contractor to the Construction Schedule shall be in full compliance with all requirements of the Contract Documents.
- H. The Contractor acknowledges and agrees that his Construction Schedule must be flexible in order to accommodate and allow for his coordination with the operations of the Owner and the work of separate contractors relating to the Project. The Owner will review the Contractor's Construction Schedule for compatibility with Owner operations and the work of separate contractors. Contractor agrees to hold meetings with the Owner and separate contractors to resolve any conflicts between Contractor's Construction Schedule and the operations of the Owner or work of separate contractors. Contractor agrees to fully cooperate with Owner and separate contractors to resolve such conflicts and to revise his Construction Schedule as reasonably required.
- I. In order to maintain the orderly progress of the work performed on the Project, the Owner shall have the right to determine, in his sole discretion, the priority between the Work performed by Contractor and the work of any separate contractors or

- Owner's operations; this decision shall be final and binding upon Contractor and shall not be a cause for extra compensation or an extension of time, except where an extension of time is granted because of a delay for which Contractor is otherwise entitled to an extension under the Contract Documents.
- J. If Contractor's Construction Schedule indicates that Owner or a separate contractor is to complete an activity or perform certain preceding work by a particular date, or within a certain duration, Owner, or any separate contractor shall not be bound to said date or duration unless Owner expressly and specifically agrees in writing to same. The review and approval or acceptance by Owner of the Construction Schedule or any other schedule or plan of construction of Contractor, does not constitute an agreement by Owner of any start or finish date in the schedule or specific durations or sequences for activities of the Owner or any separate contractor; provided, however, that nothing herein shall be construed as modifying or changing, or excusing the performance of Contractor of required portions of the Work by the Milestone Dates as set forth in the Contract Documents.
- K. The Milestone Dates set forth in the Contract Documents represent only the major items of Work and may include interface dates with the operations of the Owner, the work of separate contractors or others. Milestone Dates are Contract requirements and are of the essence to this Contract and to the coordination of the Work by Contractor. Milestone Dates represent the latest allowable start or completion time for those portions of the Work to which each Milestone Dates relates. The Milestone Dates are not intended to be a complete listing of all Work under this Contract or of all interfaces with work performed by other separate contractors, the Owner or others. Contractor shall determine the time requirements for all such interfaces and shall be responsible for planning, scheduling and coordinating the work in order to complete in accordance with those requirements.
- L. Approval or acceptance by the Owner of the Contractor's Construction Schedule, or any revisions or updates thereto, is advisory only and shall not relieve the Contractor of the responsibility for accomplishing each portion of the Work within each and every applicable Specific Date. Omissions and errors in the approved or accepted Construction Schedule, or any revisions or updates shall not excuse performance which is not in compliance with the Contract.
- M. Should Contractor intend or plan to complete the Work, or any portion thereof, earlier than any applicable Specific Date or Contract Time, Contractor shall give timely and reasonable notice of this fact to the Owner.
- N. Unless otherwise specifically provided in the Contract Documents, Contractor acknowledges that Owner has contemplated in planning and initial scheduling of the projects, that the work will be performed on a 5-day work week basis, utilizing a single 8-hour shift per day.

- O. Requirements regarding facility shutdowns, sequencing constraints and coordination with existing operations shall be required in the specifications.

1.2 POST AWARD ACTIVITIES

- A. The Owner will review: the objectives of the Schedules and Reports requirements; the procedure and requirements for the preparation of the Construction Schedule and Schedule of Values by Contractor; and, how the requirements of the Contract Documents will be monitored and enforced. Long-lead items and time requirements for work by Subcontractors will be identified.

1.3 CONSTRUCTION SCHEDULE

- A. Within seven (7) days of the orientation session, (even though Contractor may not have completed Subcontractor negotiations and executed subcontractors) the Contractor shall complete a time-scaled network graphic. The Construction Schedule shall represent the Contractor's best judgment and intended plan for completion of the Work in compliance with Milestone Dates in the Contract Documents and the Contract Time. The Construction Schedule shall take into account all foreseeable activities to be accomplished by any separate contractors, and interface dates with utility owners, the Owner's operations and others. The Construction Schedule shall anticipate all necessary manpower and resources to accomplish the activities within the durations set forth in the Construction Schedule.
- B. Owner shall have the right to require the Contractor to modify any Contractor data or any portion of the Contractor's Construction Schedule, Schedule of Values or Recovery Schedule, as herein required, with Contractor bearing the expense thereof, which the Engineer reasonably determines to be: (1) impracticable; (2) based upon erroneous calculations or estimates; (3) unreasonable; (4) required in order to ensure coordination by Contractor of the work of his Subcontractors and with the work or services being provided by any separate contractors; (5) necessary to avoid undue interference with the Owner's operations or those of any utility owners or adjoining property owners; (6) necessary to ensure completion of the Work by the Milestone Dates set forth in the Contract Documents or (8) not in accordance with the Contractor's actual operations.

1.4 SCHEDULE OF VALUES

- A. Within ten (10) days after completion of the Construction Schedule, the Contractor shall submit to the Owner a Schedule of Values for review, allocating a dollar value for the activities on the Construction Schedule. The dollar value for the activity shall be the cost of the work of the activity including labor, materials, and pro rata contribution of General Conditions requirements, overhead and profit. The sum of all

activity costs shall equal the total Contract Sum. The Contractor shall revise the Schedule of Values as necessary to gain the approval of the Owner.

- B. The activity cost for the Schedule of Values shall be coded with a cost code corresponding to the trade, Subcontractor or Supplier performing the work so that subtotals for each division of the Work can be prepared.
- C. The Schedule of Values shall, in the best judgement of the Contractor, represent a fair, reasonable and equitable dollar (cost) allocation for each activity on the Construction Schedule.

1.5 CONSTRUCTION SCHEDULE CONTENT

- A. The Construction Schedule shall consist of a time-scaled, detailed network graphic representation of all activities which are part of the Contractor's construction plan.
- B. For all major equipment and materials to be fabricated or supplied for the Project, the Construction Schedule shall show a sequence of activities including:
 - 1. Preparation of Shop Drawings and sample submissions;
 - 2. A reasonable time for review of Shop Drawings and samples or such times as specified in the Contract Documents;
 - 3. Shop fabrication, delivery, and storage;
 - 4. Erection or installation; and
 - 5. Testing of equipment and materials.
- C. The Construction Schedule shall include late completion dates for the Work that are not later than the required Milestone Dates. The time-scaled graphic network shall be drawn based upon the early start dates of activities shown on the graphic.
- D. All activity durations shall be given in calendar days.

1.6 UPDATING OF CONSTRUCTION SCHEDULE/PROGRESS REPORTS

- A. On or about the dates specified, Contractor shall arrange for his project manager and Superintendent to meet at the Project Site with the Owner to review Contractor's report of actual progress prepared by Contractor. Said report shall set forth up-to-date and accurate progress data, shall be based upon Contractor's best judgement and shall be prepared by Contractor in consultation with all principal Subcontractors and Suppliers.
- B. The progress report of Contractor shall show the activities or portions of activities, completed during the reporting period, the actual start and finish dates for these activities, remaining durations and/or estimated completion dates for activities currently in progress.

- C. Contractor shall submit a narrative report with the updated progress analysis which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors and their impact, explanations of corrective actions taken or planned, any newly planned activities or changes in sequence, and proposed logic for a Recovery Schedule, if required, as further described herein. The report shall also include:
1. A narrative describing actual work accomplished during the reporting period;
 2. A list of major construction equipment used on the Work during the reporting period and any construction equipment idle during the reporting period;
 3. The total number of men by craft actually engaged in the Work during the reporting period, with such total stated separately as to office, supervisory, and field personnel;
 4. A manpower and equipment forecast for the succeeding thirty (30) days, stating the total number of men by craft, and separately stating such total as to office, supervisory and field personnel;
 5. A list of Contractor-supplied materials and equipment, indicating current availability and anticipated jobsite delivery dates;
 6. Changes or additions to Contractor's supervisory personnel since the preceding progress report.
- D. The Contractor will provide initial computer reports and monthly reports thereafter, in accordance with the following:
1. Schedule Reports: Initial and subsequent Schedule Reports will contain the following minimum information for each activity:
 - a. Activity number, description and estimated duration in days;
 - b. Early and late finish dates;
 - c. Percentage of each activity complete as of each report;
 - d. Remaining float/days behind schedule;
 - e. Responsibility for activity. Actual start and finish dates shall be indicated for each activity, as appropriated. Dummies and completed activities will be omitted from remaining Float and Late Start Sorts.
 2. Cost Reports: Initial and subsequent Cost Reports will include the following information on each activity, sorted by trade activity:
 - a. Activity number and description;
 - b. Percentage of value of Work in place against total value;
 - c. Total cost of each activity;
 - d. Value of Work in place since last report;

- e. Value of Work in place to date;
 - f. Value of uncompleted Work.
3. As part of the updating process, the Contractor will calculate, the value of work done for each activity based on percentage complete for each activity less the amount previously paid for past percentages completed. Summation of all values of each activity less the appropriate percent of retainage shall be the amount payable to the Contractor, provided that Contractor has complied with all requirements of the Contract Documents.
- E. Contractor shall be solely responsible for expediting the delivery of all materials and equipment to be furnished by him so that the progress of construction shall be maintained according to the currently approved Construction Schedule for the Work. Contractor shall notify the Owner in writing, and in a timely and reasonable manner, whenever Contractor determines or anticipates that the delivery date of any material or equipment to be furnished by Contractor will be later than the delivery date indicated by the Construction Schedule, or required consistent with the completion requirements of this Contract, subject to updates as herein provided.
- F. Contractor shall ensure that the critical path runs through on-site activities and that off-site activities do not control the critical path of the Construction Schedule.

1.7 RECOVERY SCHEDULE

- A. Should the updated Construction Schedule show at any time that the Contractor is fourteen (14) or more days behind schedule for any Specific Date, the Contractor shall prepare a Recovery Schedule explaining and displaying how Contractor intends to reschedule his Work in order to regain compliance with the Construction Schedule.
- B. If the Contractor believes that all of the time can be recovered during the subsequent pay period the Contractor will be permitted to prepare a Recovery Schedule as set forth below. However, if the Contractor believes it will take more than thirty (30) days to recover all of the lost time, he shall prepare and submit a revision to the Construction Schedule.
- 1. The Contractor shall prepare and submit to the Owner a one-month maximum duration Recovery Schedule, incorporating best available information from Subcontractors and others which will permit return to Construction Schedule at the earliest possible time. The Contractor shall prepare a Recovery Schedule to same level of detail as the Construction Schedule for a maximum duration of one month. This Recovery Schedule shall be prepared in coordination with other separate contractors on the Project;
 - 2. Within two (2) days after submission of Recovery Schedule, the Contractor shall participate in a conference with the Owner to review and evaluate the Recovery Schedule. Within two (2) days of conference, the Contractor shall submit the revisions necessitated by the review for review and approval. The Contractor shall

use the approved Recovery Schedule as his plan for returning to the Construction Schedule.

3. Contractor shall confer continuously with the Owner to assess the effectiveness of the Recovery Schedule. As a result of this conference:
 - a. If the Contractor is still behind schedule, the Contractor shall prepare a Schedule Revision and comply with all of the requirements of a Schedule Revision as stated herein and the other requirements of the Contract Documents; provided, however, that nothing herein shall limit in any way the rights and remedies of the Owner and as provided elsewhere in the Contract Documents.
 - b. If the Contractor has successfully complied with provisions of the Recovery Schedule, the Contractor shall return to the use of the approved Construction Schedule.

1.8 SCHEDULE REVISIONS

- A. Should Contractor desire to or otherwise be required under the Contract Documents to make modification or changes in his method of operation, his sequence of Work or the durations of the activities in his Construction Schedule, he shall do so in accordance with the requirements of the Contract Documents. Revisions to the approved Construction Schedule must be approved in writing by the Owner.

1.9 FLOAT TIME

- A. Float or slack time associated with one chain of activities is defined as amount of time between earliest start date and latest start date or between earliest finish date and latest finish date for such activities, as calculated as part of the Construction Schedule. Float or slack time shown on the Construction Schedule is not for exclusive use or benefit of either the Owner or the Contractor. Contractor specifically agrees that float time may be used by the Owner in conjunction with their review activities or to resolve for any modification of the Milestone Dates or an extension of the Contract Time, or a claim for additional compensation as a result of any Project problem, Change Order or delay which only results in the loss of available positive float on the Construction Schedule.
- B. Float time shown on the Construction Schedule shall not be used arbitrarily by Contractor in a manner which unnecessarily delays separate contractors from proceeding with their work or in a way which is detrimental to the interests of the Owner.

PART 2 - NOT USED

PART 3 - NOT USED

++ END OF SECTION ++

SECTION 01353

TRAFFIC CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Virginia Department of Transportation Road and Bridge Specifications, 2007.
- B. Manual on Uniform Traffic Control Devices, 2009.
- C. Virginia Work Area Protection Manual, Standards and Guidelines, 2005.

1.2 SUMMARY

- A. This Section includes requirements for maintenance of traffic during construction.
 - 1. Contractor shall provide all traffic control, traffic transitions and public safety measures in accordance with Virginia Work Area Protection Manual and MUTCD. Contractor will provide at no extra cost to the City any necessary safety provisions required by the Director of Transportation and Environmental Services (T&ES).
 - 2. No Street nor any portion of a street may be closed to traffic (either vehicular or pedestrian) without the approval of the Director of T&ES.
 - 3. At the time a lane of traffic is closed, Contractor shall furnish at his own expense all barricades, all lights, all flagmen and warning signs deemed necessary by the Director of T&ES. All of the above must conform to the Virginia Work Area Manual on Uniform Control Devices on Streets and Highways, latest edition.
 - 4. Contractor shall furnish at his own expense all electronic arrows and electronic message signs deemed necessary by the Director of T&ES.
 - 5. Contractor must maintain access at all times for emergency vehicles (fire, rescue and police) to get into any area under repair and to comply with any request of the chief(s) of either or both Departments (Fire and Police) that will assist them to perform their duties.
 - 6. Contractor must furnish to the Director of T&ES the name, address and telephone number of some local person who can be contacted after hours if Contractor's services are required for lights, barricades and other services that are the responsibility of Contractor.
 - 7. No City owned signs placed by the Department of T&ES shall be removed or reinstalled by Contractor. If it is necessary to remove City owned signs, Contractor shall notify the Director of T&ES who will arrange for the removal and reinstalling the signs.
 - 8. Contractor shall notify the Director of T&ES at least forty-eight (48) hours in

advance of beginning the work activities and shall advise the Director as the job progresses as to changes in initial traffic requirements and shall immediately notify the Director of any change not contemplated in advance or any emergency that may arise which would affect the planned traffic pattern.

1.3 MEASUREMENT AND PAYMENT

- A. Components of Maintenance of Traffic will not be measured, but be paid on the basis of the contract Lump Sum price, complete-in-place. This price shall include all labor, materials, equipment and incidentals required to maintain and protect traffic through areas of construction, maintain public and private entrances, and protecting the traveling public within the limits of the project as indicated in the Drawings and as specified in these Specifications.

PART 2 - PRODUCTS

- 2.1 See VDOT Specification Section 512 – Maintaining Traffic, for products.

PART 3 – EXECUTION

3.1 GENERAL

- A. See VDOT Specification Section 512 – Maintaining Traffic, as modified herein, for Execution requirements.
- B. Public Awareness: No less than one week prior to the commencement of construction, night work, lane closures, or any other activity deemed disruptive by the Director of T&ES, the Contractor shall use Variable Message Signs notifying the public of planned construction activity. At a minimum, the message shall announce the date and time of the planned activity.

++ END OF SECTION ++

SECTION 01400

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by City Engineer or authorities having jurisdiction are not limited by provisions of this Section.
- C. See Sections for specific test and inspection requirements.
- D. Measurement and Payment: Work associated with Testing Services will be incidental to the respective works being performed.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by City Engineer.
- C. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- D. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

- E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
- H. Experienced: When used with an entity, "experienced" means having successfully completed projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to City Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to City Engineer for a decision before proceeding.

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.

7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in- service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the Commonwealth of Virginia and who is experienced in providing engineering services of the kind indicated.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.6 QUALITY CONTROL

A. Quality-control services to be provided by the Contractor.

1. Engage a qualified testing agency to perform required quality-control services.
2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Submit a certified written report, of each quality-control service.

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

C. Retesting/Reinspecting: Provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with City Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify City Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements.
6. Do not perform any duties of Contractor.

E. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and - control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

B. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

++ END OF SECTION ++

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SECTION 01580

PROJECT IDENTIFICATION AND SIGNS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Owner shall provide project identification and information signs.
- B. Contractor to install all provided signs.
- C. No signs except those specified shall be displayed unless approved by OWNER.

1.2 SUBMITTALS

- A. Submit in accordance with prescribed Shop Drawing procedure.
- B. Include the following information:
 - 1. Type of grade of materials.
 - 2. Layout, size, trim, framing, supports and coatings.
 - 3. Size and style of lettering.
 - 4. Samples of colors.

1.3 CONSTRUCTION

- A. Design signs and supports to withstand 75 mile per hour wind.

1.4 INSTALLATION AND MAINTENANCE

- A. Location of signs shall be as shown or directed by the ENGINEER.
- B. Maintain signs so they are clean, legible and upright. Keep grass and weeds cut away from signs.
- C. Repair and repaint damaged signs. Relocate signs as required by progress of the Work.
- D. Remove signs when project is completed or when directed by the ENGINEER.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

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SECTION 02020

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1. SECTION SUMMARY

This Section is concerned with the procedures, methods and materials required to control the erosion of soil from the work site. It is intended to minimize the movement of soil from the work areas onto adjacent property or into watercourses to the fullest extent possible.

1.2. REFERENCED STANDARDS

In installing devices and performing other procedures, comply fully with applicable provisions of Virginia Erosion and Sedimentation Control Handbook, latest edition (The Handbook).

1.3. RELATED WORK SPECIFIED ELSEWHERE

A. Section 02920 – FINE GRADING, SEEDING AND SODDING

PART 2 - PRODUCTS

Comply with standards and specifications of The Handbook regarding materials and implements employed.

PART 3 - EXECUTION

3.1. TRENCHING

Construction of trenches for pipelines, except within rights of way, is subject to the following restrictions:

- A. Where consistent with safety and space considerations, place excavated material on the uphill side of any trench.
- B. Do not permit more than 500 feet of work area to be disturbed at any time, including excavation ahead of installation and backfill behind installation. Grade backfilled areas across the entire work area and install temporary erosion control measures regularly as the work progresses. Do not leave any disturbed areas untreated overnight.
- C. Direct discharge from pumps or other ditch dewatering devices in a way that will not adversely affect any flowing stream, drainage way or off site property.

3.2. GRADED OR EXCAVATED AREAS

Stabilize all slopes, channels, ditches or any other disturbed area after grading or backfilling.

Implement interim measures daily and comprehensive measures immediately after final earthwork is completed or whenever a section will remain inactive for more than fourteen (14) days.

Maintain any temporary facilities to insure adequate functioning until final stabilization is effective. Immediately before establishment of effective permanent control measures, remove unneeded or unusable temporary facilities.

3.3. STREAM PROTECTION

Where construction is close to existing streams or other waterways, perform construction in a way that will not contribute to stream pollution. Include the following as a minimum:

- A. Keep construction debris, excavated materials, brush, rocks, refuse and topsoil as distant from the stream bank as possible. Where excavating in a streambed, conform to the details shown on the drawings to prevent stream flow from passing through the excavation.
- B. Regular movement of machinery and other equipment across or along any streambed is prohibited. Provide temporary culverts or bridges (temporary vehicular stream crossings) to carry vehicles and equipment across flowing streams. Under no circumstances will a streambed be permitted to become a thoroughfare for machinery traffic.
- C. Use properly installed silt fences or straw bales along entire stream frontage affected by grading and/or excavation operations.

Portions of the stream disturbed during the project shall be restored in accordance with the Drawings.

3.4. PUMP DISCHARGE

Practice pump discharge management to reduce the production of sediment. Discharge water onto stabilized surfaces and then allow it to be filtered by appropriate temporary measures such as straw bales. Give ditches required to remove pumped water from excavations the same consideration as any other man-made waterway and stabilize in a commensurate manner.

3.5. FINAL GRADING AND SEEDING

Perform finish grading, topsoiling, seeding and sodding as specified in following Sections:

Section 02920 – Grassing (Fescue) Install sod on all slopes steeper than 1:3 (V:H).

After construction operations are complete, reestablish vegetation and install temporary cover. In any instance, install effective measures promptly and maintain until permanent measures have become fully established.

3.6. MAINTENANCE

Maintain erosion and sedimentation control measures and facilities in condition adequate to insure proper functioning as designed. Make periodic inspections at sufficiently frequent

intervals to detect any deficiency in the structural stability, capacity or other requisites of the facilities that might impair their effectiveness. Take immediate steps to correct any deficiency found.

3.7. MEASUREMENT AND PAYMENT

- A. Components of Erosion and Sediment Control will not be measured, but be paid on the basis of the contract Lump Sum price, complete-in-place. This price shall include all labor, materials, equipment and incidentals required for installing, maintaining and removing all temporary erosion and sediment control measures including but not limited to: stream pump around practice, tree protection, super silt fence, inlet protection, and diversion dikes.

++ END OF SECTION ++

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SECTION 02050

REMOVAL AND DEMOLITION OF EXISTING WORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Contractor shall provide all labor, materials, equipment and services necessary for the removal and demolition of existing work and temporary protection of existing equipment as indicated, shown on the Drawings, specified and required for the proper completion of the project.
- B. Such portions of the existing work which will have to be removed, abandoned in place or altered to permit completion of the work done under these Contract Documents must be removed or altered so as not to endanger any part of the existing structures. Removal work includes the removal of existing construction as specified and/or indicated including existing construction where necessary for the installation of new work and the connection of new work to existing work. Removal work may also include removal of unknown quantities of buried material remaining from prior construction and plant operations.
- C. All materials so removed shall become the property of the Contractor, except as otherwise indicated or specified, and shall be disposed of by the Contractor off the Owner's property in a legitimate disposal area.

1.2 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.
- C. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.3 SUBMITTALS

- A. Submit a schedule of demolition activities in accordance with Section 01300.
- B. The schedule of demolition activities shall be for information only, unless otherwise indicated.

C. Schedule of demolition activities indicating the following:

1. Detailed sequence of demolition activities and removal work, with starting and ending dates for each activity.
2. Interruption of utility services.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DEBRIS

- A. Debris shall not be allowed to accumulate in or about the work and shall be removed from the Owner's property as the work progresses. Work shall proceed in such a manner as to minimize the spread of dust and flying particles.

3.2 PROTECTION OF PROPERTY

- A. Conduct demolition so that Owner's operations will not be disrupted.
- B. All existing work which is to remain and which is adjacent to work to be removed shall be protected. The Contractor shall provide, install and maintain all necessary protection, shoring and bracing to adequately support, safeguard and retain the existing structure in its original condition ready for the new construction and until new construction is completed. The Contractor shall also provide all necessary guards, barriers and coverings to protect existing finishes and equipment to remain.
- C. The Contractor shall provide temporary protection of equipment from dust and debris during structural modification work.

3.3 REPAIRS

- A. All damage to existing work caused by the Contractor's operations shall be repaired or replaced by the Contractor at no extra cost to the Owner. All existing piping, conduit and similar services shall be reconnected, if disturbed. All existing work shall be restored to at least its original condition.

3.4 REMOVALS

- A. Existing work, where indicated, shall be carefully removed, properly stored, and reused in new locations shown. Any part of the existing work damaged during removal shall be satisfactorily repaired or replaced with new parts of the same design and quality as the existing parts at no additional cost to the Owner.

- B. Existing concrete shall be removed where indicated or required to accommodate the new work in accordance with Section 03700.
- C. For disposition of removed equipment to be turned over to the Owner, see Paragraph 3.07.

3.5 CUTTING AND PATCHING

- A. The Contractor shall perform all cutting and patching of existing work which may be required to complete the work under this Contract. All cutting and patching shall be done by skilled mechanics of each trade involved. Cutting shall be done neatly to proper lines with minimum damage to adjacent work. Patching shall be done carefully and shall match existing work in type, quality and finish.

3.6 PROCEDURES FOR ABANDONMENT

A. Piping

1. To the greatest extent possible, all piping to be relocated shall be constructed in their respective new locations before abandonment or removal so as to minimize the down time of that utility. All pipe abandonment and removal shall be closely coordinated with the Owner.

B. Structures

1. Remove all equipment from interior of the structures.
2. Remove those parts of concrete structures which project above an elevation three feet below the finished grade elevation or as required to complete new construction.

3.7 ITEMS OF REMOVED EQUIPMENT TO BE TURNED OVER TO THE OWNER

- A. The Contractor shall turn over to the Owner at a location as determined by the Owner, any item noted to be removed, but not reused, that the Owner wishes to retain. All other items shall become the property of the Contractor and shall be promptly removed from the site.

3.8 MEASUREMENT AND PAYMENT

- A. Components of Removal and Demolition of Existing Work will not be measured, but be paid on the basis of the contract Lump Sum price, complete-in-place for Site Clearing, Removal and Disposal of Existing Work. This price shall include all labor, materials, equipment necessary for site clearing, removal and demolition of existing

work including: removal of concrete manhole, sewer, pipes, trees, stumps, stone, clearing, grubbing, disposal of waste material and all other site clearing activities.

+ + END OF SECTION + +

SECTION 02200

EARTHWORK, EXCAVATION, TRENCHING AND BACKFILLING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The Contractor shall provide all labor, materials, equipment and services necessary for, and incidental to, preparing the Site, excavating, trenching, excavation support and dewatering systems, drainage, pumping, proof-rolling, laboratory testing, backfilling, compacting, in-place field compaction testing, grading and protection of the Work as shown on the Drawings, as herein specified, and in accordance with the STANDARD SPECIFICATIONS, as defined below.
- B. The Contractor shall accept the Site in the condition in which it exists at the time of the award of the Contract.
- C. Excavation is unclassified, as described in Paragraph 3.02 EXCAVATION AND SUBGRADE PREPARATION of this Specifications Section. All excess or unsuitable materials excavated shall be removed from the Site by the Contractor and disposed of at a permitted off-site disposal location of its own choosing, at no additional cost to the Owner.

1.2 QUALITY ASSURANCE

A. Standard Specifications and Details

Reference in this Section to STANDARD SPECIFICATIONS or STANDARD DETAILS shall mean the following, and are hereby made part of this Specifications Section:

1. Virginia Department of Transportation, "Road and Bridge Specifications", latest edition, and "Road and Bridge Standards", latest edition, with the latest incorporated revisions.
2. "Virginia Erosion and Sediment Control Handbook", dated 1992, with the latest incorporated revisions.
3. City of Alexandria "Design and Construction Standard" dated July 1989.

B. Codes and Standards

The following Standards in effect on the date bids are received form a part of this Specifications Section to the extent indicated by the following references:
American Association of State Highway and Transportation Officials (AASHTO):

M 6 Fine Aggregate for Portland Cement Concrete.

M 43 Standard Sizes of Coarse Aggregate for Highway Construction.
M 145 Classification of Soils and Soil-Aggregate Mixtures.
T 88 Particle Size Analysis of Soils.
T 89 Determining the Liquid Limit of Soils.
T 90 Determining the Plastic Limit and Plasticity Index of Soils.
T 119 Slump of Portland Cement Concrete.
T 180 Moisture-Density Relations of Soils Using 10-lb. Ram and 18-inch Drop.
T-99 Moisture-Density Relations of Soils Using 5-lb. Ram and 12-inch Drop.
T 191 Density of Soil In-Place by the Sand-Cone Method.
T 206 Penetration Test and Split-Barrel Sampling of Soils.
T 238 Density of Soils and Soil-Aggregate In-Place by Nuclear Methods.
T 239 Moisture Content of Soil and Soil-Aggregate In-Place by Nuclear Methods.
T 265 Laboratory Determination of Moisture Contents of Soils.

American Society for Testing and Materials (ASTM):

D421-85(98) Standard Practice for Dry Preparation of Soil Samples for Particle- Size Analysis and Determination of Soil Constants.
D422-63(98) Standard Test Method for Particle-Size Analysis of Soils.
D1557-00 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
D2216-98 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
D2487-00 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
D2922-01 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
D3740-01 Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
D4318-00 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
D5261-92(03) Standard Test Method for Measuring Mass Per Unit Area of Geotextiles.
E329-00b Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
E548-94e1 Standard Guide for General Criteria Used for Evaluating Laboratory Competence.

All Work shall comply with Occupational Safety and Health Regulations for Construction of the Code of Federal Regulations.

1.3 MONITORING AND TESTING

A. Monitoring

The Contractor shall perform excavation, subgrade preparation, and construction of fills and backfills.

B. Testing

The Contractor shall be responsible for all testing of soils, including field sampling, laboratory testing and field testing. The Contractor shall employ the services of an independent, professional testing consultant to perform the Work. Inspections and test results shall be certified by the testing consultant, stating that the tests and observations were performed by the consultant or under the direct, supervision of the consultant, that the results are representative of the materials or conditions being certified by the tests, and that the results are in conformance with the Specifications. All costs for inspection and testing will be incidental to this project and no additional payment will be made for testing and inspection.

C. Testing Facilities

The testing consultant shall provide the services of an approved commercial testing laboratory. Approval of testing facilities shall be based on requirements described in ASTM D 3740 and ASTM E 329.

D. Laboratory Testing

Test reports or material certifications shall be submitted to the Engineer prior to use of any material in the Work. Any change in the source or change in the character of the material shall require the Contractor to retest and resubmit for approval. Material certifications and laboratory test reports shall include the following:

1. Source of Material.
2. Particle Size Analysis (AASHTO T88).
3. Modified Proctor (AASHTO T180).
4. Natural Moisture (AASHTO T265).
5. Atterberg Limits (AASHTO T89 and T90).

E. In-Place Field Compaction Testing

1. Nuclear gauge calibration checks of both density and moisture shall be performed by the Contractor's consultant at the beginning of the Project, on each different type of material encountered, and at intervals as required by the Engineer. The calibration curves shall be checked and adjusted if necessary by the procedure described in ASTM D 2922 paragraph "Adjusting Calibration Curve". Copies of calibration curves and results of calibration tests shall be furnished to the Engineer within 24 hours of the conclusion of tests.
2. The Contractor's testing consultant shall perform in-place field compaction tests of the density and moisture content of fill and backfill. Upon completion of each layer of fill in a designated area, the Contractor shall be required to allow

time for the Engineer to inspect the tests performed by the testing consultant. Copies of test results shall be furnished to the Engineer within 24 hours of the conclusion of tests.

3. Tests performed by the Contractor's consultant shall be in randomly selected locations and in sufficient numbers to verify that the specified density is being obtained. The following number of field density tests shall be the minimum acceptable for each type operation:
 - a. Fills: One test per lift per 10,000 square feet or fraction thereof.
 - b. Backfill Against Structures: One test per lift per 100 linear feet.
 - c. Trench Bedding and Backfill: One test per lift per 200 linear feet.
4. If the compaction test results do not meet those specified, the material shall be removed, replaced, recompact, and retested to meet the Specifications requirements.

1.4 JOB CONDITIONS

A. Existing Utilities

1. The existing utilities shown on the Drawings are from available records and field surveys. The Contractor shall verify all information to its own satisfaction, and shall notify the Engineer and utility owner of any impact by the Work. The Contractor shall test pit existing utilities that impact construction two weeks in advance of excavation.
2. Should piping or other utilities not shown on the Contract Drawings be encountered during excavation, the Contractor shall notify the Engineer and the utility owner immediately. The Contractor shall cooperate with the Engineer and the utility owners in keeping services and facilities in operation.
3. Utilities designated to remain in place or which serve adjacent structures are to be protected and maintained at all times during construction. Active utility lines damaged in the course of construction operations shall be repaired or replaced immediately at no additional cost to the Owner, the Engineer, or utility owner.
4. The Contractor shall demolish and completely remove from the Site existing underground utilities that are designated to be removed.

1.5 DEWATERING, DRAINAGE AND PUMPING

- A. During construction, the grading operations shall be performed in such a manner that the excavations shall be well drained at all times. Sufficient grading shall be performed during the progress of the Work so that no water, at any time, is allowed to flow towards the walls of the Structures or trenches. The entire Site shall be well drained and free from water pockets. When necessary, sumps shall be provided and pumped continuously. The Contractor shall maintain and keep all ditches open and free from soil and debris while in service or until final acceptance of the Work and all grading shall be done on neat, regular lines. All Work shall be done in proper

sequence with all other associated operations. Before any slab or surfacing is placed, all utilities to be covered shall be installed and all drainage facilities shall be installed which are required to allow free and uninterrupted flow of the surface and ground water from the Site or to pumping sumps.

- B. High groundwater levels may be present throughout the Project Site. The Contractor shall provide and continuously operate and maintain all temporary dewatering, drainage and pumping systems required to satisfactorily perform all Work under the Contract. Water shall be controlled to such an extent as may be necessary to keep excavations free from water during construction and to maintain a minimum of 12 inches dry below the bottom of pipes and structures. The Contractor shall be entirely responsible for the design and adequacy of all dewatering systems.
- C. Dewatering systems required to perform the Work shall be provided, operated and maintained by the Contractor at no additional cost to the Owner.
- D. The Contractor shall exercise every precaution to prevent flotation of any of the Work constructed under this Contract, and the Contractor shall be responsible for all damage due to flotation.
- E. Grading shall be done as necessary to prevent surface water from flowing into trenches or other utility excavations, and any water accumulating therein shall be continuously removed and properly filtered to remove sediment.
- F. The method of water disposal shall be in compliance with all erosion and sediment control regulations and permit requirements. Water shall not be discharged into the sewer system.
- G. Methods of dewatering excavations shall be at the Contractor's discretion. Continuous investigations and checks shall be made by the Contractor to assure that the dewatering system employed is functioning properly, and not causing damage or settlement to adjacent surfaces or structures. Temporary pipes or flumes shall be used to carry surface water across open and/or unstabilized construction areas. The system shall be modified as required and repairs for damage caused by the system shall be the responsibility of the Contractor.

1.6 TEMPORARY EXCAVATION SUPPORT SYSTEMS

The Contractor shall temporarily support the sides and ends of all excavations, where necessary, with braces, sheeting, shoring, stringers or other methods of the type, size and quality required. The Contractor shall be entirely responsible for the design and adequacy of the excavation support system.

Pile driving hammers or vibratory hammers shall only be used to drive or extract temporary excavation support systems. The Contractor shall be responsible for any damage caused by operations involving vibrations.

- A. Unless otherwise specified on the Drawings or required by the Engineer, temporary excavation support systems shall be removed as refilling proceeds, in a manner so as not to damage any structures, roadbed, fill or private property.
- B. If, where specified on the Drawings, excavation support systems are to be left in-place after backfill has been completed, they shall be cut off 2 feet below finished grade.
- C. If the Contractor determines that removal of temporary excavation support systems will jeopardize any existing facilities or any of the work performed under this Contract, the Contractor shall submit written justification and obtain approval to leave all or part of the temporary excavation support systems in-place and shall cut them off 2 feet below finished grade.

1.7 PROTECTION OF PROPERTY, STRUCTURES AND UTILITIES

The Contractor shall, at its own risk and at no additional cost to the Owner, maintain, support-in-place, and protect all pipes, poles, cables, utilities, walls, buildings, and other structures or property in the vicinity of its work, whether above or below ground, or that may appear in the excavation. The Contractor shall at all times have available on Site sufficient quantity of timber, planks, beams, chains, ropes, etc., and shall use them as necessary for supporting any structures and utilities that are uncovered, undermined, endangered, threatened or weakened. In the event that the Contractor damages any existing utility lines the Contractor shall notify the Engineer and the utility owner immediately.

1.8 SUBMITTALS

The Contractor shall submit the following:

- A. Qualifications of the independent, professional testing consultant and commercial testing laboratory in accordance with Paragraph 1.03 MONITORING AND TESTING.
- B. Material certifications and laboratory test reports in accordance with Paragraph 1.03 7MONITORING AND TESTING.
- C. Manufacturer's product catalog data for geosynthetics (geotextiles, geogrids, geocomposites, geomembranes, etc.) showing compliance with the specification requirements of PART 2 – PRODUCTS of this Specifications Section. The submittal shall be provided a minimum of 2 weeks prior to the planned installation of the materials, shall include two samples of each material to be furnished, and shall be labeled appropriately with the Manufacturer's name and product identification.

- D. A compaction plan including a list of proposed compaction equipment to be used, Manufacturer's specifications and catalog data, and the Contractor's plan for compaction in the Work.
- E. Delivery tickets for each load of material brought to the Site showing the following information:
 - 1. Name and location of supplier or source.
 - 2. Type and amount of material delivered by volume and weight.
 - 3. Test information on the material as required by this Specifications Section.
- F. Copies of nuclear gauge calibration curves and results of calibration tests within 24 hours of conclusion of tests.
- G. Copies of test results and re-test results of in-place field compaction within 24 hours of conclusion of each test.
- H. Excavation Support Systems and Dewatering Systems:
 - 1. Submit working drawings and calculations for the design of all excavation support systems and dewatering systems to be utilized for the project. The working drawings and calculations shall be performed by an engineer obtained and paid for by the Contractor. The Contractor's engineer shall be a Professional Engineer engaged in such practice and licensed in the Commonwealth of Virginia, and shall sign and seal all drawings and calculations. Signed and sealed drawings and calculations submitted to the Engineer will be for information only.
 - 2. The working drawings and calculations for the dewatering systems shall include the following information:
 - a. Planned method of dewatering.
 - b. Excavation plan.
 - c. Location of the water table before and during dewatering.
 - d. Location and capacity of such facilities as dewatering wells, well points, sumps, collection and discharge lines, proposed standby unit, and protective fills and ditches required for control of ground water and surface water.
 - 3. The Contractor shall be responsible for determining the existing subsurface conditions for the excavation support systems and dewatering systems.
- I. Manufacturer's product catalog data, and a detailed description of the means, methods, equipment and material used, for temporary cofferdam structures, in accordance with the requirements of Paragraph 3.08 STREAM CROSSINGS. The submittals shall be provided a minimum of two weeks prior to the planned installation.

PART 2 – PRODUCTS

2.1 FILL AND BACKFILL MATERIAL

- A. Unless otherwise shown on the Drawings, fill and backfill material shall be suitable material from on-site excavations or from other sources. The material shall be clean earth. The material shall be free from vegetable matter, organic material, sludge, grit, trash, muck, roots, logs, stumps, frozen material or other deleterious substances. Rubber, ashes, cinders and other miscellaneous inorganic fill substances removed from required excavations within the project and which will decompose, consolidate further, or shrink appreciably within the fill may not be incorporated in the fill. Rubble and construction debris shall not be used in the Work.
- B. Except as otherwise specified or approved, the material shall not contain rocks or lumps larger than 6 inches in greatest dimension. The material shall not contain mica in quantities that are sufficient to affect compaction characteristics. Materials having a maximum dry density of less than 100 pounds per cubic foot (AASHTO T180), and materials having a plasticity index (AASHTO T90) greater than 30, shall not be used.
- C. Suitable material is any material meeting the quality requirements specified above, for the particular location and application specified, which is not frozen and which has a moisture content at the time it is placed that enables the material to be compacted to the density specified. Unsuitable material is any material not meeting all the requirements for suitable material.

2.2 BORROW MATERIAL

Borrow material, from off-site sources, shall meet the following requirements and shall be provided where specified on the Drawings:

- A. AASHTO M145 Soil Groups A-1, A-2-4, A-2-6.
- B. AASHTO M145 Soil Group A-3 Fine Sand.

2.3 DENSE GRADED AGGREGATE (DGA)

Dense Graded Aggregate shall meet the following requirements and shall be used where specified on the Drawings and shall be furnished from a specific source or sources approved in writing by the Engineer:

- A. VDOT No. 21A (Dense Graded Aggregate / Base).
- B. VDOT No. 21B (Dense Graded Aggregate / Subbase).

2.4 OPEN GRADED COARSE AGGREGATE (OGCA)

Open Graded Coarse Aggregate shall meet the following requirements and shall be provided where specified on the Drawings:

- A. VDOT No. 5, No. 56, No. 57, No. 68, No. 7, No. 78, or No. 8 Aggregates (AASHTO M43).

2.5 GEOTEXTILE

Geotextile shall be used where specified on the Drawings and shall meet the following requirements:

- A. Geotextile shall be a nonwoven fabric consisting of continuous filaments of polyester or polypropylene formed into a stable network by needle punching. It shall be inert to commonly encountered chemicals and hydrocarbons, mildew and rot resistant, and insect and rodent resistant. The fabric shall have a mass per unit area of at least 12 ounces per square yard as determined by ASTM D5261.
- B. The geotextile shall provide a permeable layer or media, while retaining the soil matrix. It shall be provided in rolls wrapped with protective covering to protect the fabric from mud, dirt, and debris. The geotextile shall be 'Trevira' as manufactured by Hoechst or 'Fibretex' as manufactured by Acme STW, Inc., Or Approved Equal.

2.6 RIPRAP

Riprap for slope protection and stabilization and other uses indicated on the Contract Drawings shall be Class I and shall meet the quality requirements of Section 204 of the VDOT STANDARD SPECIFICATIONS.

2.7 FLOWABLE FILL

Flowable fill shall consist of a mixture of fly ash, Portland cement, fine aggregate and water and shall have a compressive strength of 50 to 200 psi.

PART 3 – EXECUTION

3.1 SITE PREPARATION

Site preparation shall be in accordance with Specifications Section 02110 SITE CLEARING.

3.2 EXCAVATION AND SUBGRADE PREPARATION

- A. Excavation for grading, pavements, walls, piers, slabs, footings, structures, trenches, utility systems and their appurtenances shall be unclassified and shall consist of the excavation of whatever material is encountered to the lines, grades, and sections shown on the Drawings and specified, including such excavation as is necessary for all ditches, curbs and other features.
- B. Unless otherwise shown on the Drawings, suitable material removed from the excavation shall be reused as fill and backfill in the grading, filling, backfilling and preparation of subgrade for pavements, structures, and trenches and at such other places as required, to the extent required to complete the Work. If on-site excavated material is determined to be unsuitable due to inadequate or excessive moisture content, the Contractor shall make the material suitable by either aerating the material if it is too wet, or spraying the material if it is too dry, to bring the moisture content within the required range. The material shall then be thoroughly mixed for uniform distribution of moisture content, prior to placement and compaction.

The Contractor shall properly store or stockpile and protect all materials that are to be reused in the Work. The Contractor shall replace, at his own expense, material that was suitable when excavated, which has subsequently become unsuitable because of careless, neglectful, wasteful or unprotected storage. All unsuitable or excess material removed from the excavation shall be removed from the Site and disposed of by the Contractor, at no additional cost to the Owner, except where disposal on the Site is specifically provided for and approved.

- C. Preparation of the surface: Before depositing fill material, the surface of the ground shall be cleared of all refuse, rubble, and other debris. All organic matter, mud, muck, sludge and unsuitable soils shall be removed from the surfaces upon which fills are to be placed and the surface shall be leveled. Openings, animal burrows, stump holes, old pipes and other holes and depressions shall be eliminated, filled or cleaned as required.
- D. Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be plowed or scarified deeply or where the slope ratio of the original ground or rock surface is steeper than five horizontal to one vertical, the ground or rock shall be stepped or benched.
- E. Subgrade is defined as 6 inches below the underside of the outside of pipe barrels, manholes and structures and as shown on the Drawings.
- F. Subgrade areas outside of trench excavations shall be proof rolled with a minimum of 3 slow passes of a large, smooth drum, vibratory roller capable of exerting a dynamic force of 4,500 lbs/LF resulting in a net minimum dynamic force of 20,000 lbs (10 tons) or greater. Proof rolling shall be performed to densify the areas and to locate soft areas. Soft areas shall be removed and replaced with controlled, compacted fill as hereinafter specified.

- G. Subgrade for all foundations, slabs, footings, pavements, structures, and utility excavations, shall be firm, undisturbed earth/rock except where drainage courses or compacted fills are specified or are required in areas where unsuitable material has been removed.
- H. Whenever a condition is encountered where subgrade is at the bottom of a structure and subgrade is part rock and part soil, the rock shall be removed to a depth of 6 inches below subgrade and replaced with suitable material and as defined in PART 2 – PRODUCTS of this Specifications Section, and compacted in accordance with Paragraph 3.03 COMPACTED FILLS AND BACKFILLS.
- I. Where unsuitable subgrade conditions are encountered or any part of the bottom of the excavation is below the specified subgrade under foundations, slabs, footings, pavements, structures, or utilities:
 - 1. Unsuitable foundation materials shall be excavated and removed to a firm bottom below subgrade elevations. The excavation below subgrade shall be refilled to subgrade using Open Graded Coarse Aggregate (OGCA).
 - 2. In trenches, prior to placing the refill, a nonwoven geotextile shall be placed directly onto the soft material in order to prevent movement of the soft material into the refill. The geotextile shall wrap around the refill and overlap for the full trench width. Normal bedding shall be placed directly onto the geotextile.
 - 3. Unsuitable foundation conditions or areas disturbed or rendered unstable and are caused by the Contractor's construction methods or equipment, shall be corrected by the Contractor at no additional cost to the Owner. These corrections shall include the necessary excavations and backfills.
 - 4. Overexcavation: Where excavations are made to a depth below the subgrade elevations shown on the Drawings or specified, without authorization, the excess excavation shall be filled, at no additional cost to the Owner to the required level as described above.

3.3 COMPACTED FILLS AND BACKFILLS

For inspection purposes, the Contractor shall coordinate with the Engineer prior to placing any fill or backfill. Unless otherwise noted in this Specifications Section, placing, spreading and compacting suitable material for fills and backfills other than trench excavations, unless otherwise noted, shall be as follows:

- A. The fill or backfill for structures may include suitable, on-site material originating on the job, as defined in PART 2 - PRODUCTS of this Specifications Section, unless otherwise noted.
- B. Fill and backfill material shall be placed in approximately horizontal layers that, before compaction, shall not exceed 8 inches in thickness. Fill and backfill material within 5 feet of structures shall be placed in approximately horizontal layers that, before compaction, shall not exceed 6 inches in thickness. Each layer shall be spread

uniformly and evenly. All rocks shall be distributed throughout the earth materials and all voids shall be carefully filled and the material properly compacted by rolling, tamping, vibratory compactors, or other methods specified herein. Compaction by heavy rollers or other heavy equipment is prohibited within 5 feet of any structure.

C. Moisture content of fill and backfill material shall be within 2% above or below the optimum moisture content for the material while placing and during compaction. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to not less than the following as determined by ASTM D1557, Modified Proctor:

1. 92% of maximum dry density for cohesive soils.
2. 95% of maximum dry density for cohesionless soils.

Cohesionless soils are defined as granular soils containing less than 15% by weight passing the No. 200 sieve. Optimum moisture content and maximum dry density shall be determined by AASHTO T 180. Weaving, creeping or pumping of the soil beneath the roller shall be sufficient evidence that the moisture content of the fill or subsoils is excessive, and that required compaction has not been achieved.

D. The fill or backfill shall be constructed in such a manner that the surface will be sloped to drain at all times and shall be sealed by rolling at the completion of each day or prior to rain. No fill or backfill shall be placed, spread or rolled while it is frozen or thawing or be placed upon frozen or thawing ground or during unfavorable weather conditions. Any compacted layer that has been previously frozen shall be reworked or removed before the next layer is placed. Materials containing free water or having a moisture content higher than specified shall not be deposited upon the fill or backfill until after they have been dried to the specified moisture content.

E. After completing the construction of structure foundations, footings, walls, etc., below finished grade, all forms shall be removed and the excavation cleaned of all trash and debris. The excavation shall not be used for the disposal of refuse. Any refuse or other foreign materials shall be removed before backfilling. No backfill shall be placed against any structure until the structure is complete and the concrete has reached its specified strength, or the structure has been properly braced and has sufficient strength to support the applied load.

3.4 TRENCH BACKFILL

During backfilling, great care shall be taken not to disturb the pipes by dropping or throwing anything on them from the bank above, or by walking on top or alongside of them.

A. Pipe and Manhole Bedding

1. Pipe bedding depth shall be from trench subgrade, up to the minimum dimension above the underside of the pipe barrel, as shown on the Drawings.
2. Pipe bedding material shall be any Open Graded Coarse Aggregate (OGCA) meeting the requirements as defined in PART 2- PRODUCTS of this Specifications Section.
3. The bedding material shall be compacted using approved hand-operated mechanical tampers or approved compaction equipment before laying the pipe and during placement of the haunch, in accordance with Paragraph 3.03 COMPACTED FILLS AND BACKFILLS.
4. Compacted bedding material shall provide a uniform and continuous bearing and support for the full length of each pipe, except for that portion under the bell. Bell holes shall be excavated in the bottom and sides of bedding to allow for the proper making of joints, without extra payment.

B. Backfill

Backfill shall be placed to the extent shown on the Drawing details. No rock or lump greater than 6 inches in greatest dimension shall be used for trench backfill.

1. In improved areas, within all road rights-of-way, under paved areas and within 25 feet of any above-grade Structure, backfill shall meet the requirements that follow:
 - a. Backfill material shall be VDOT No. 21 A.
 - b. Backfill material shall be placed in 6-inch layers and compacted to 95% of the maximum dry density in accordance with Paragraph 3.03 COMPACTED FILLS AND BACKFILLS.
2. In unimproved areas, backfill shall meet the requirements that follow:
 - a. Backfill material shall be suitable, on-site backfill material excavated from the trench, or borrow material meeting the requirements as defined in PART 2 – PRODUCTS of this Specifications Section.
 - b. Backfill material shall be placed in 12-inch layers and compacted in such a manner that a completely dense refill is obtained which is free of voids and not susceptible to settlement in accordance with Paragraph 3.03 COMPACTED FILLS AND BACKFILLS, except that compaction shall be to at least 90% of the maximum dry density as determined by AASHTO T 180.

3.5 TOPSOIL STRIPPING

- A. The Contractor shall be responsible for stripping all topsoil to depths in which found. The topsoil shall be carefully segregated from the trench materials and stockpiled for reuse in the Work. Upon completion of the excavation work, the Contractor shall

replace the topsoil to the depths in which found and to a minimum depth of 4 inches. The Contractor shall provide topsoil, as needed, from approved off-Site sources.

- B. Subgrade for topsoil is defined as the surface upon which the topsoil is placed. Salvaged topsoil shall be existing topsoil stripped from the Site within the prescribed limits. Furnished topsoil shall be the Contractor's responsibility to obtain from approved off-site sources.
- C. For all non-paved disturbed areas of the Site, place a 4-inch depth of topsoil on all areas disturbed by construction activities. The Contractor shall provide grading and fine grading as required to restore the Site. Upon completion of grading and prior to final seeding, mulching and placement of sod, all debris shall be cleaned up and removed from the Site.

3.6 STREAM CROSSINGS

- A. Stream crossings shall be conducted in accordance with permit requirements and sediment and erosion control requirements as shown on the Drawings and as specified. Concrete encasement shall be required at stream crossings as shown on the Drawings.
- B. Temporary cofferdam structures shall be "Port-a-Dam", Or Approved Equal, and methods and materials shall be in accordance with Paragraph 1.07, SUBMITTALS.
- C. Riprap Slope and Channel Protection
 - 1. Subgrade preparation and placement of riprap and other measures for the protection of river and stream channels and slopes shall be as shown on the Drawings.
 - 2. Placement of riprap shall be by excavator bucket and by hand, to provide a dense, interlocking layer. Free-fall dumping shall not be allowed.

3.7 MEASUREMENT AND PAYMENT

- A. Earthwork will not be measured and all labor, tools, materials, equipment and incidentals associated with Earthwork are incidental to other items.

+ + END OF SECTION + +

SECTION 02352

VINYL SHEET PILING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish vinyl sheet piling, fixtures and pipe penetrations.
2. The extent of the vinyl sheet piling is shown on the Drawings.

B. Related Work Specified Elsewhere:

1. Section 01270, Unit Prices

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications

1. Manufacturer shall have a minimum of 5 years experience of producing vinyl sheet piling and shall show evidence of at least 5 installations in satisfactory operation.
2. Vinyl sheet piling and fixtures shall be the product of one manufacturer.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Detailed drawings and data on vinyl sheet piling and corner pieces. Submit these with Shop Drawings required under Sections 01300.
2. All shop drawings are to be sealed by a Professional Engineer.

B. Certificates: Submit certificates of compliance with references standards.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General

- A. All sheet piling shall be manufactured entirely from a rigid, high impact, ultraviolet-(UV) inhibited, weatherable vinyl compound. All exposed surfaces of the sheet piling shall be UV resistant, and comprised of virgin material with a minimum ASTM D4216 Cell Classification of 1-42443-33. If mono-extrusion technology is used, the entire sheet pile must be comprised of virgin material with a minimum ASTM D4216 Cell Classification of 1-42443-33.
- B. Sheet piling shall meet the following properties shown on the drawings, Products specifications are based upon Everlast ESP 4.1 Vinyl Sheet Pile:
 - a. Strength Rating, M (Lbs-Ft/Ft): 4,288
 - b. Allowable Shear, V (Lbs/Ft): 3,446
 - c. Thickness, t (inches): 0.30
 - d. Section Modulus, Z (in³/ft): 15.6
 - e. Moment of Inertia, I (in⁴/ft): 62.3
 - f. Ultimate Tensile Stress (psi): 6,300
 - g. Creep Limited Stress (psi): 4,000
 - h. Modulus of Elasticity, E (psi): 380,000
 - i. Co-Extruded: Yes
 - j. Section Depth (inches): 8
 - k. Section Width (inches): 20
 - l. UV Stabilized: Yes

PART 3 – EXECUTION

3.1 SITE PREPARATION

- A. All clearing or other site preparation within the area to be occupied by the vinyl sheet piles shall be completed before the sheet piling is installed as shown on the drawings.

3.2 INSTALLATION

- A. Vinyl sheet piling shall be installed as specified in the construction plans or as directed by the Technician.
- B. The sheet piling shall be placed by one of the following methods:
 - 1. Driving Sheet Piling
 - a. The Contractor shall provide driving heads and other devices for sheet pile driving that conform to the recommendations of the manufacturer.
 - b. The sheet piling shall be driven in such a manner as to insure lock engagement and integrity throughout the entire length of each sheet pile. The sheet piles shall be held in proper alignment during driving by means of assembling frames or

other suitable temporary guide structures. Temporary guide structures shall be removed when they have served their purpose.

- c. At any time the forward edge of the sheet pile wall is found to be out of correct alignment:
 1. The sheet piling already assembled and partly driven shall be driven to the required depth
 2. The taper sheet piles shall be then driven to bring the forward edge into correct alignment before additional regular sheet piling is assembled and driven.
- d. The Contractor shall not attempt to drive sheet piles beyond the point of refusal, as indicated by excessive bouncing of the hammer or kicking of the sheet pile as concurred by the Contractor.

2. Trench Embedment of Sheet Piling

- a. Vinyl sheet piling is embedded by excavating a trench to the dimensions and lines shown on the drawings and backfilling.
- b. Backfill material shall contain no frozen soil, sod, brush, roots or other perishable material.

3.3 INSPECTION

A. Cutting off sheet piles

1. The Contractor shall cut off the sheet pile at the specified elevations. The length of the sheet pile cut off shall be sufficient to permit the removal of all damaged material.

B. Defective Sheet Piles

1. Defective or damaged sheet piles shall not be driven and any sheet pile ruptured in the interlock or otherwise damaged during installation shall be pulled and replaced.

C. Contractor shall inspect all vinyl sheet piling to assure that sheets are free from defects in material and workmanship. The compatibility of all sheet piling and fixtures shall be verified by the Contractor.

D. Contractor shall bear all costs to demonstrate tolerances are acceptable to the Owner.

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SECTION 02710

SANITARY SEWERS AND APPURTENANCES

PART 1 – GENERAL

1.1 DESCRIPTION - GENERAL

- A. The Contractor shall furnish all labor and provide all materials and equipment necessary for the complete and satisfactory installation of all pipe, fittings and appurtenances to the lines, grades and elevations shown on the Contract Drawings and as specified herein.
- B. Related Sections:
 - 1. Section 02200 – EARTHWORK, EXCAVATION, TRENCHING AND BACKFILLING.
 - 2. Section 03400 – PRECAST CONCRETE MANHOLES AND APPURTENANCES.

1.2 SUBMITTALS

Shop drawings, shall be submitted for items specified. For material and equipment readily identified in standard publications of equipment manufacturers, it will be sufficient to submit only the manufacturer's standard catalog cut in the submission.

1.3 QUALITY ASSURANCE

- A. The Engineer will inspect all materials before, during and after installation to ensure compliance with these Contract Documents. When specific material tests are called for in the referenced standards and specifications, the Owner shall have the option of requiring that any or all of these tests be performed for materials furnished for a specified project.

1.4 REFERENCES

- A. ASTM C1244 – Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.
- B. AWWA C104 –Standard for Cement-Mortar Lining for Ductile Iron Pipe and Fittings.
- C. AWWA C111 – Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

D. AWWA C151 – Standard for Ductile-Iron Pipe, Centrifugally Cast.

NOTE: All references listed shall be the latest version thereof.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All pipe shall be supplied in the longest available length for each size.
- B. All pipe and appurtenances shall be new and of the sizes indicated on the Drawings.
- C. There shall be no change in pipe material from manhole to manhole.
- D. The Contractor shall verify all dimensions of special castings and fittings, pipe equipment, etc., so that all of the pipe work performed will fit together properly and will conform to the arrangement as shown on the Drawings. In selecting laying lengths of fittings, the Contractor shall be guided by the indicated dimensions on the drawings. All pipe and specials shall be accurate to the dimensions shown.

2.2 DUCTILE IRON PIPE

- A. Pipe shall conform to "Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds For Water or Other Liquids," ANSI A21.51 (AWWA C151). Unless otherwise required by the drawings or the contract, use Thickness Class 53 for all ductile iron pipe. Joints shall be "Push-On" joints conforming to ANSI- A21.11 (AWWA C111). The exterior of the pipe shall have a protective tar coating. The interior coating of all pipe and fittings shall conform to one of the following:
 - 1. Apply minimum 0.281-inch thick lining consisting of sand and high alumina cement. Conform to AWWA C104, except when cement is used. Protect exterior spigot ends (6-inch maximum) and spigot face with 8 mil epoxy coating. Protect interior faces of bell, including gasket cavity, and all interior of fittings with like thickness of epoxy coating.
 - 2. Apply minimum 40 mils (dry film thickness) Ceramic Epoxy Lining to pipe and fittings. Protect gasket area and spigot ends (6-inch maximum) with 6 mils nominal, 10 mils maximum Protecto Joint Compound. Apply all material according to manufacturer's specifications. The ceramic epoxy must be a high build multi-component Amine cured Novalac Epoxy Lining, Protecto 401, or approved equal. Test every section of pipe and every fitting for pinholes with a nondestructive 2,500 volt test.

PART 3 – EXECUTION

3.1 STORAGE

A. Pipe shall be stored in accordance with manufacturer's recommendations.

3.2 PIPE INSTALLATION

- A. The Contractor shall have on the site, at all times, factory approved equipment to machine cut the end of short pieces of pipe to standard couplings and jointing materials. Whenever a pipe requires cutting, the pipe shall be cut in a neat and workmanlike manner without damage to the pipe so as to have a smooth end at right angles to the axis of the pipe. After cutting the pipe, bevel the outside cut- end of the pipe about $\frac{1}{4}$ of an inch back at an angle of about 30 degrees with the centerline of the pipe. Remove any sharp edges or burs that could damage the gasket.
- B. The pipe and accessories shall be inspected for defects prior to lowering into the trench. Bowed sections of pipe will not be acceptable. Any installation of pipe which has been bowed, whether or not the bow has been corrected, will not be allowed. Any defective, damaged or unsound material shall be repaired or replaced as directed by the Engineer.
- C. All foreign matter or dirt shall be removed from the interior of the pipe before lowering into position in the trench. The open ends of all pipe lines shall be provided with a stopper carefully fitted, so as to keep dirt and other substances from entering the pipe. Brush the ends of the pipe so that proper joints can be made.
- D. All pipe, fittings, valves and accessories shall be carefully lowered into the trench using suitable equipment in such manner as to prevent damage to pipes and fittings. Under no circumstances shall the pipe or accessories be dropped or dumped into the trench.
- E. 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 bottom half of the pipeline. No wedging or blocking will be permitted in laying pipe.
- F. 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 bedded and secured in place. Any defects due to settlement shall be made good by the Contractor. Bell holes shall be dug large enough to insure that the pipe is firmly bedded on the full length of the barrel. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipes shall be used.
- G. The sealing surface of the pipe, the bell to be joined, and the gaskets shall be cleaned immediately before assembly, and assembly shall be made as recommended by the manufacturer. When pipe laying is not in progress, the open ends of installed pipe shall be closed to prevent entrance of trench water into the line. Whenever water is excluded from the interior of the pipe, enough backfill shall be placed on the pipe to

prevent floating. Any pipe that has floated shall be removed from the trench and the bedding restored. No pipe shall be laid when the trench conditions or the weather is unsuitable for proper installation as determined by the Engineer.

- H. No pipe shall be laid upon a foundation into which frost has penetrated nor at any time that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation.
- I. Gaskets shall be of proper design for the joint type utilized and shall be installed in accordance with the manufacturer's recommendations.
- J. After pipes have been laid and the joints have been made, there shall be no walking on or working over them except such as may be necessary in tamping, until there is a covering of at least two (2) feet in depth over the pipe crown.
- K. All excavations in which the pipe is being laid shall be kept free from water and no joint shall be made under water. Water shall not be allowed to rise in the excavation until the joint material has received its set. The greatest care shall be used to secure water tightness and to prevent damage to or disturbance of the joints during the backfill process, or at any time. Inflatable plugs shall not be used.

3.3 TESTING

- A. Sewers will be inspected to determine if any deviation from line and grade has occurred. All sanitary sewer mains shall be inspected by Closed Circuit Television camera (CCTV) prior to acceptance by the City. Any deficiencies, such as: Sags (bellies) in the pipe, rolled joints, leaks, damaged pipe or out of round pipe shall be corrected before acceptance by the City.
- B. An acceptance test is required for all sanitary sewer mains and manholes. The preferred method of testing for mains is air and vacuum testing for manholes. When testing with air, test methods and acceptability criteria shall be in accordance with ASTM-F1417. Vacuum testing methods and acceptability criteria shall be in accordance with ASTM-C1244; with the exception that vacuum testing shall be done after backfill has been placed around structure.
- C. An exfiltration test using water for both mains and manholes is an option if approved by the City. If exfiltration is permitted, outward leakage shall not exceed 50 gallons per inch of nominal pipe diameter per mile per day (2,400 gpd/mi maximum) for any section of the system including manholes. If an exfiltration test is employed, a minimum of 4 feet of head at any point in the line and maximum head of not more than 10 feet shall be used.
- D. Use inflatable stoppers to plug all lines into and out of the manhole being tested. The stoppers shall be positioned in the lines far enough from the manhole to insure testing to those portions of the lines not air tested. The manhole shall then be filled to the top

with water. A 24-hour soak shall be allowed. Leakage shall not exceed 0.25 gallon per hour for a four-hour test period.

- E. The Contractor shall furnish weirs, standpipes, pipe plugs, water, pressure gauges, stop watches, air compressor, hose and such materials and assistance as required to perform these tests. All acceptance tests shall be conducted by the contractor in the presence of the City. All testing is the responsibility of the Contractor.
- F. Acceptance tests shall not be made until the sanitary sewer, manholes and required sewer service connections, as shown on the Drawings, have been installed; sewer trenches backfilled and compacted to finished sub-grade.
- G. Sanitary sewer lines, structures, facilities or appurtenances thereto not meeting the requirements of these standards shall be replaced or repaired in a manner approved by the City. Defective materials, pipe or fittings shall be completely removed and replaced with new materials. Evidence of excessive leakage, unsatisfactory alignment or poor workmanship shall be justification for the City to require complete removal of the entire line between manholes and reconstruction in accordance with the plans and specifications and the standards of the Authority.
- H. Whenever it has been necessary to construct under drains or place gravel under pipelines to dewater the trench during construction of the sewers, the acceptance test will not be made until pumps (which have been used in the dewatering process) have been disconnected.
- I. Schedule all acceptance tests with the City at least 48 hours (2 City work days) in advance. Each section of completed sewer shall be tested. Generally, sewers will be tested from manhole to manhole.

3.4 DEFECTS TO BE MADE GOOD

If at any time before the expiration of the guarantee period under this contract, any broken pipes or any other defects are found in any of the lines or in any of their appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default, or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects just before placing and any found defective shall not be placed in the line.

3.5 EXISTING UTILITIES

- A. Existing utilities have been indicated on the drawings in accordance with the information shown on record drawings. The Owner expressly disclaims any responsibility for the accuracy or completeness of information shown. It shall be the Contractor's responsibility to verify the location and size of existing piping. The

Owner assumes no responsibility for damages or downtime for the Contractor or their subcontractors resulting from the inadequate or negligent performance by utility locators.

- B. Existing utilities and service shall be carefully protected; all damage to utilities by the work shall be immediately repaired by the Contractor to the satisfaction of the Engineer, using materials of the kinds damaged. No additional payment will be made for such repair work.
- C. The Contractor shall bear the entire cost of all monetary penalties which may be assessed by utility companies whose facilities are damaged and/or put out of service by the Contractor during the prosecution of the work.
- D. Where new piping is to be connected to existing piping, the Contractor shall drain or purge the existing piping, cut, grind and prepare the existing piping in every respect in order that it be suitable for connecting to the new piping. A flexible, watertight coupling shall be utilized to join the new piping to the existing piping. The coupling shall be of the size, type and material suitable for use with the piping materials.
- E. Where existing piping is to be abandoned or removed, the Contractor shall not reuse the piping on the project. Abandoned piping remaining in place shall be bulkheaded in accordance with the Drawings.

3.6 MEASUREMENT AND PAYMENT

- A. Payment for the Sanitary Sewer shall be by the linear foot measured along the center of the pipeline.
- B. The Price per linear foot for this item shall be full compensation for all labor, equipment and materials necessary for installing, testing and placing the sewer into operation, including all survey, stakeout, all as-built surveys, test pitting, excavation, sheeting, shoring, dewatering, bedding, installation of pipe, utility locating, backfilling replacing unsuitable materials with suitable materials and compaction. The cost of all pipe, fittings, bends, short pieces, connectors, acceptance testing, surface restoration, including all work required for or incidental to the satisfactory installation of the Sanitary Sewer.

++ END OF SECTION ++

SECTION 02920

FINE GRADING, SEEDING AND SODDING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Contractor shall furnish all labor, equipment, materials and appurtenances necessary to perform all fine grading, seeding, and related work on all areas within all areas that have been impacted by construction activities including excavation areas, equipment travel and parking areas and material lay-down areas.

1.2 SUBMITTALS

- A. Submit certificates of compliance before delivery of materials for seed, fertilizer, lime and mulch.
- B. Topsoil sample testing shall be performed by a commercial approved by the Owner at the expense of the Contractor.

1.3 GUARANTEE

- A. Seeded areas shall be healthy, and in flourishing condition at the end of the guarantee period. Seeded areas shall be free of dead or dying spots and shall have normal density, size and color.
- B. All seeded areas not in a vigorous, thriving condition, as determined by the Engineer during and at the end of the warranty period, shall be reseeded by the Contractor, without cost to the Owner, as soon as weather conditions permit.
 - 1. Seeded areas shall be subject to all requirements stated in this Specification.
 - 2. The Contractor shall make all necessary repairs to work damaged while reseeding. Such repairs shall be done at no extra cost to the Owner.

1.4 FINAL INSPECTION AND FINAL ACCEPTANCE

- A. At the end of the warranty period, the Engineer will inspect the work for final acceptance upon written request of the Contractor. Request shall be received at least 10 calendar days before the anticipated date for final inspection.
- B. Upon completion and reinspection of reseeding necessary in the judgment of the Engineer at that time, the Engineer will recommend to the Owner that final acceptance of work of this section be given.

PART 2 - MATERIALS

2.1 TOPSOIL

- A. Topsoil shall be Class A stockpiled topsoil that has been salvaged from excavation areas and other areas within the areas disturbed by construction activities. Where existing topsoil has been permanently removed by the Contractor or rendered unusable, new topsoil shall be applied prior to seeding.

2.2 LIME AND FERTILIZER

- A. Fertilizer for seeding shall be a mixture of Nitrogen, Phosphorus and Potassium (NPK) in the ration of 10-20-10. The Fertilizer shall be uniform in composition, free flowing and suitable for application with standard seeding equipment. Furnish to the Engineer copies of delivery slips indicating quantities provided.
- B. Lime shall be agricultural grade limestone.

2.3 SEEDING

- A. The Contractor shall use a grass mixture of 90% Kentucky 31 Tall Fescue and 10% Kenblue. The percentage shall be on a weight basis. The seeding rate for this mixture shall be 4 pounds per 1,000 square feet. The Kentucky 31 Tall Fescue shall have a minimum purity of 98% and germination of not less than 85%. The Kenblue shall have a minimum purity of 90% and 75% or more germination. Seeding shall not be done in windy weather and only while earth surface is damp. All seed containers shall be tagged indicating mixture, purity and germination. Furnish to the Engineer, copies of delivery slips indicating quantities provided.
- B. Seeding for all areas adjacent to stream crossings shall be Annual Ryegrass (*Lolium multiflorum*), Millet (*Setaria italica*), Barley (*Hordeum* sp), Oats (*Uniola* sp.), and or Rye (*Secale cereale*).

2.4 WOOD CELLULOSE FIBER MULCH

- A. The mulch shall be organic or chemical mulch as defined in the STANDARD SPECIFICATIONS.

PART 3 - CONSTRUCTION

3.1 GENERAL

- A. All grassed areas that are disturbed by the Contractor shall be restored by seeding. Such areas shall include, but not be limited to, the actual construction area, travel areas including access road areas, the Contractor's stockpile and storage areas and any other area disturbed by the Contractor during the course of the work.

3.2 PREPARATION OF GRADE

- A. Prior to seeding the areas shall be brought back to existing grade. All stones, stumps, and other debris shall be raked from the topsoil and removed from the site. Raking shall be done with a stone rake which will remove stones and debris greater than three-fourths (3/4) inches in size within 2" from the surface of the soil.
- B. After spreading the topsoil, the entire area shall be fine graded so that no humps, ridges, depressions or other variations exist. Any deficiencies shall then be corrected with additional topsoil and fine graded so that the area shall drain.

3.3 TOPSOIL PREPARATION

- A. All areas previously stripped of topsoil and all disturbed areas shall be scarified or tilled to a depth of 2-inches after having been graded and shaped in reasonably close conformity to the grade and cross sections of the plans. Apply lime and initial fertilization prior to seeding. Seeding of the topsoil areas should be done within 14 days after the topsoil has been spread. Topsoil shall be spread over areas devoid of topsoil to a minimum depth of 2 inches on 3:1 or steeper slopes and 4 inches elsewhere.
- B. Suitable topsoil shall be from stockpiles of onsite topsoil. Any additional material required shall be furnished by the Contractor. This soil shall be friable loam. It shall be free from subsoil, clay lumps, stones, stumps, roots, brush, weeds, litter and trash or other harmful material.

3.4 LIME AND FERTILIZER

- A. Agricultural grade limestone shall be applied at a rate of 90 pounds per 1,000 square feet.
- B. Fertilizer shall be applied at the rate of 23 pounds per 1,000 square feet.

3.5 SEEDING

- A. Seeding shall evenly applied with a broadcast seeder, drill, cultipacker seeder or hydroseeder. Small seeds shall be planted no more than 1/4-inch deep.

3.6 MULCHING

- A. All seeded areas shall be mulched immediately upon completion of seed application

3.7 IRRIGATION

- A. Supply irrigation water during abnormally hot or dry weather, and as needed to maintain growth

3.8 MAINTENANCE

- A. Seeded areas shall be maintained until the final inspection is completed. Maintenance shall consist of providing protection against traffic, reseeding, weeding, refertilizing, watering, and mowing as necessary to produce a completely established stand of grass. Mowing operations shall not begin until the grass is well-established and the grass shall not be mowed lower than two (2) inches.
- B. When the average height of seeded areas has grown to six (6) inches, it shall be mowed with approved mowing equipment to a minimum height of two (2) inches. Mowing thereafter during the maintenance period shall be regulated by the amount of growth but in no case shall the grass be allowed to exceed six (6) inches in height.

3.9 MEASUREMENT AND PAYMENT

- A. Payment for Temporary and Permanent Seeding will not be measured, but will be paid on the basis of contract lump sum price for Temporary and Permanent Seeding. Payment for this item shall be full compensation for all labor, material and equipment for temporary and permanent seeding including fertilizer, mulch, watering, maintenance, replacement, and all other items required for or incidental to satisfactory completion of the temporary and permanent seeding.

+ + END OF SECTION + +

SECTION 03400

PRECAST CONCRETE MANHOLES AND APPURTENANCES

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This Specifications Section includes the furnishing of all plant labor, equipment, appliances, and materials and in performing all operations in connection with the construction of manholes complete, in strict accordance with this Specifications Section and the applicable standard details.

1.2 APPLICABLE STANDARDS

- A. ASTM A48 – Standard Specification for Gray Iron Castings.
- B. ASTM C443 – Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
- C. ASTM C478 – Standard Specification for Precast Reinforced Concrete Manhole Sections.
- D. ASTM C857 – Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
- E. ASTM C890 – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
- F. ASTM C923 – Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes, and Laterals.

1.3 DESIGN REQUIREMENTS

- A. Structural design for precast concrete structures shall be prepared by a Registered Professional Engineer licensed in the Commonwealth of Virginia.
- B. Distribution of earth loading and live load shall be in accordance with ASTM C857 or ASTM C890. Design vertical live load shall be AASHTO HS20-44 and shall not be less than 300 pounds per square foot.
- C. The precast concrete structures shall be designed to resist flotation with the water level at the ground surface. The structures shall also be designed to resist all stresses encountered during casting, handling, transportation, and erection.

PART 2 - PRODUCTS

2.1 PRECAST SECTIONS

- A. Precast manhole sections shall be manufactured in accordance with the latest revision of ASTM C478.
- B. Unless otherwise shown on the plans, provide precast concrete manholes consisting of cylindrical body sections, an eccentric conical top section and an expanded base section.
- C. Each section may have integrally cast lifting lugs or keyways. Through holes are prohibited.
- D. The joints between sections shall be self-centering and make a uniform watertight joint. Joints shall be formed entirely of concrete employing a round rubber gasket. In addition to the O-ring gasket, a cold applied joint sealer may be used to assist in sealing the joint from either internal or external hydrostatic forces. Joint design shall meet the requirements of ASTM C443. Gaskets shall meet the requirements of ASTM C361.
- E. Mortar joints are prohibited.
- F. Manholes shall be supplied with flexible pipe connections suitable for the specified pipe material. Flexible gaskets for pipe connections to manholes shall be made with a flexible rubber manhole sleeve with a flanged waterstop cast by the manufacturer into the manhole base or other flexible connectors acceptable to the Service Authority. Flexible connections shall meet the requirements of ASTM C923.
- G. Flexible pipe connections shall be provided for existing manholes to be cored. Connections for cored holes shall be Kor-N-Seal as manufactured by National Pollution Control Systems, Or Approved Equal. Flexible connections shall meet the requirements of ASTM C923.
- H. Manholes shall be manufactured with the number of connections required. Manholes with more connections than required are prohibited.
- I. The exterior of all manholes shall be coated with a bituminous coating.

2.2 MANHOLE STEPS

- A. Manholes shall be supplied with cast-in-place steps constructed of fiberglass, cast iron or steel. Steps shall have a plastic coating, be non-slip type and meet OSHA requirements.

2.3 FRAMES AND COVERS

- A. Manholes shall be supplied with frames and covers of cast gray iron conforming to ASTM A48, Class 30.
- B. Castings shall be of best quality, tough, gray iron, free from cold shuts, blow holes, and other imperfections. Castings shall be sound, true to form and thickness, cleaned by sandblasting and neatly finished. The bearing surfaces shall be machine ground and finished to insure satisfactory seating and anti-rocking.
- C. Castings shall conform to Drawings.

2.4. MANHOLE CHIMNEY SEALS

Internal or external chimney seals shall be provided and installed for all manholes. The seals shall be made of a high-grade rubber compound conforming to ASTM C923.

2.5. WATERTIGHT MANHOLE INSERTS

Watertight manhole inserts shall be provided and installed in all manholes except watertight manholes. The inserts shall be No Flow/Inflow Inserts or Rainstopper Inserts as manufactured by Southwest Packing and Seals, Or Approved Equal.

PART 3 - EXECUTION

3.1 PRODUCT HANDLING

- A. Precast concrete manholes shall be transported and handled with proper equipment to protect the elements from damage. Manholes shall be handled by means of lifting inserts embedded in the concrete, or other acceptable means. Damaged manholes that cannot be satisfactorily repaired shall be replaced by new manholes at no additional cost to the Owner.

3.2 INSTALLATION

- A. Manholes shall be set so as to be vertical and with sections in true alignment with a ¼-inch maximum tolerance to be allowed. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides. Sections shall be joined with gaskets as specified herein.

3.3 INVERT CHANNELS

- A. Invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be made with a smooth curve with as large a radius as permitted by the manhole base section.
- B. Changes in size and grade of the channels shall be made gradually and evenly. The bench of the manhole outside the channels shall be smooth and shall slope toward the

channels at 1-inch: 1' minimum. The invert channel is to be at least 0.8 times the diameter of the pipe.

3.4 WATER-TIGHT WORK REQUIRED

- A. Manholes shall be completely water-tight. All leaks shall be repaired immediately with a non-shrink material, or the entire manhole shall be replaced. Ground water must be kept below all parts of the masonry or concrete foundations and walls until the mortar and concrete has obtained an adequate set.

3.6 MANHOLE FIELD TEST

- A. All manholes will be tested using the negative air pressure test (vacuum) in accordance with ASTM C 1244, latest edition for water tightness. Manholes will be visually inspected after backfilling. Contractor may backfill before testing with the understanding that any repairs will be made from the exterior of the manhole.
 1. Use mechanical or pneumatic plugs capable of resisting the test pressure without bracing.
 2. Plug all lift holes and make certain all manhole boots, stub-outs and plugs are secure to prevent movement during test. Do not allow anyone in the manhole during the test.
 3. Use a tester capable of testing the manhole from the rim of the frame to the invert. Install the tester in accordance with the Manufacturer's requirements.
 4. Draw a 10-inch of mercury (Hg) vacuum on the manhole in accordance with the tester Manufacturer's recommended procedures. Do not exceed the 10- inch Hg vacuum. Measure and record the time it takes for the vacuum to drop from 10- inch to 9-inch of Hg.
 5. Manhole depth shall be measured from the rim elevation to manhole invert out. For test purposes, the manhole diameter shall be the diameter of the base section, regardless of reducers.
 6. If the time in the table below, for the appropriate manhole diameter and depth, elapses before the vacuum drops 1-inch Hg the manhole will have passed the test. If the vacuum drops 1-inch Hg before the times shown in the table below, for the applicable manhole diameter and depth, the manhole will have failed the test. The Contractor shall identify and correct the cause of failure and retest until the manhole passes.

Depth of Manhole (Feet)	Manhole Diameter (Inches)					
	Test Time (Seconds)					
	48"	60"	72"	84"	96"	108"
10' or less	60	75	90	105	120	135
Greater than 10' but less than 15'	75	90	105	120	135	150
Greater than 15' but less than 25'	90	105	120	135	150	165
25' and greater	105	120	135	150	165	180

Note: The times listed above are more stringent than ASTM C 1244 requirements.

Test times for structures other than the manhole diameters listed, shall be based on the times for manholes of the nearest equivalent volume or as required by the Engineer.

3.7 MEASUREMENT AND PAYMENT

- A. Payment for the Precast Concrete Manhole shall be per each manhole.
- B. The Price per each manhole for this item shall be full compensation for all labor, equipment and materials necessary for installing, testing and placing the manhole into operation, including all excavation, sheeting, shoring, dewatering, bedding, backfilling, manhole base, benches and riser, lining, manhole frames and covers and all work required for or incidental to the satisfactory installation of Precast Concrete Manholes.

+ + END OF SECTION + +

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SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section includes specifications for all labor, materials, equipment and services necessary for, and incidental to, the furnishing and installation, complete, of all miscellaneous metal work, including the pipe support system shown on the Drawings and as herein specified.
- B. Anchors, fastenings, accessories and incidentals that are required and are to be built into the work shall be furnished.

1.2 MISCELLANEOUS ITEMS

- A. All items shall be of sizes and shapes and constructed of materials as indicated on the Drawing or specified. Items furnished, unless otherwise specified, shall be the manufacturer's standard approved products and shall be fabricated in accordance with the best shop methods. The Contractor shall verify all measurements and shall take all other measurements necessary before fabrication. Shearing and punching shall leave clean, true lines and surfaces. Permanent steel connections shall be welded or bolted with high tensile bolts. Curved work shall be evenly sprung. Castings shall be sound and free from warp holes and other defects that impair their strength or appearance. Castings shall be made in as large sections as practicable, with jointing made where least conspicuous. Exposed surfaces shall have a smooth finish and sharp well-defined lines and arises. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Galvanized steel items shall be hot-dip zinc coated after fabrication. Unless otherwise shown, all exposed fastenings shall be of the same material, color and finish as the metal to which applied. Holes and connections for the work of other trades shall be provided. At the proper time, built-in items to be incorporated into the structures shall be delivered and set in place.
- B. Members shall be framed in substantial manner and all details connections and fastenings shall be in accordance with the best accepted practice, and shall be subject to the approval of the Owner Representative.

1.3 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible. Do not delay job progress; allow trimming and fitting where taking field measurements before fabrication might delay work.

- B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Structural steel fabrication and erection shall conform to the latest editions of the following publications:
1. American Institute of Steel Construction - "Code of Standard Practice for Steel Buildings and Bridges".
 2. American Institute of Steel Construction - "Specifications for Structural Steel Buildings - Allowable Stress Design and Plastic Design".
 3. American Institute of Steel Construction - "Specifications for Structural Joints using ASTM A325 or A490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
 4. American Welding Society D1.1 - "Structural Welding Code".
- D. The latest editions of the following ASTM Standards shall be adhered to for materials and Practices:
1. ASTM A36- "Specification for Structural Steel".
 2. ASTM A53- "Specification for Pipe, Steel, Black and Hot-Dipped, Zinc- Coated Welded and Seamless".
 3. ASTM A123- "Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products".
 4. ASTM A153- "Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware".
 5. ASTM A193- "Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service".
 6. ASTM A194- "Specifications for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High Temperature Service".
 7. ASTM A240- "Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels".
 8. ASTM A242- "Specification for High-Strength Low-Alloy Structural Steel".
 9. ASTM A276- "Specification for Stainless and Heat-Resisting Steel Bars and Shapes".

10. ASTM A283- "Specification for Low and Intermediate Tensile Strength Carbon Steel Plates".
11. ASTM A307- "Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile".
12. ASTM A320- "Specification for Alloys-Steel Bolting Materials for Low-Temperature Service".
13. ASTM A325- "Specification for High-Strength Bolts for Structural Steel Joints".
14. ASTM A384- "Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies".
15. ASTM A653- "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process".
16. ASTM A668- "Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use".
17. ASTM A786- "Specification for Rolled Steel Floor Plates".
18. ASTM B221- "Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes".
19. ASTM C508- "Specification for Cellular Elastomeric Preformed Gasket and Sealing Material".
20. ASTM C881- "Specification for Epoxy-Resin-Base Bonding System for Concrete".
21. ASTM F593- "Specification for Stainless Steel Bolts, Hex Cap Screws and Studs".

1.4 SUBMITTALS

- A. Submit shop drawings showing all materials, sizes, finishes, locations, attached hardware and fittings, and details for all items and fabricated metalwork, including field erection details showing cuts, copes, connections, holes, threaded fasteners and welds. Indicate all welds, both shop and field, by symbols conforming to AWS standards.
- B. Furnish setting diagrams, erection plans, templates, and directions for the installation of backing plates, anchors, and other items.

- C. Submit catalog descriptions of manufacturer's standard items.
- D. Submit welding records as detailed in Section 05120.
- E. Reproduction of Engineer's contract drawings for the purpose of making shop drawings shall not be permitted.
- F. All submittals shall state the location and usage for each product.

1.5 PRODUCT DELIVERY, HANDLING AND STORAGE

- A. Positively identify, and match-mark if applicable, all materials, items and fabrications, for installation and field assembly.
- B. Wherever practicable, deliver items to jobsite as complete units, ready for installation or erection, with all anchors, hangers, fasteners and miscellaneous metal items required for installation.
- C. Store steel above the ground surface on platforms, skids, blocking or other supports.
- D. Protect from exposure to conditions that produce rust.
- E. Store beams with webs vertical.
- F. Handle steel so no parts are bent, broken or otherwise damaged and avoid damage to other material and work.
- G. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

1.6 LOCATION AND QUANTITIES

It is the intent of the Specification to indicate the quality, character and type of the items. The location and size shall be as shown on the Drawings.

PART 2 - PRODUCTS

2.1 STANDARD ITEMS

Whenever practicable, item shall be standard products, meeting the requirements specified herein, of a manufacturer regularly engaged in production of such items.

2.2 SHAPES AND BARS

- A. Mild Steel: ASTM A36, unless otherwise indicated.

B. Galvanized: ASTM A36, ASTM A123.

C. Stainless: ASTM A276, Type 304.

D. Aluminum: Alloy 6061-T6.

2.3 PLATE, SHEET, STRIP

A. Mild Steel: ASTM A36, or A283, Grade D.

B. High-Strength: ASTM A242.

C. Galvanized: ASTM A653

D. Stainless: ASTM A240, Type 304.

E. Aluminum: Alloy 6061-T6.

2.4 PIPES AND TUBES

A. Mild Steel: ASTM A53, Type S, Grade B, Schedule as shown on drawings.

B. Galvanized: ASTM A53, Type S, Grade B, Schedule as shown on drawings.

C. Aluminum: ASTM B221, Alloy 6061 - T6.

2.5 FASTENERS

Galvanized for use with galvanized material; stainless for use with corrosion-resistant and stainless material.

A. Stainless

1. Bolts: ASTM A 193, Grade B8, Class 2.

2. Nuts: ASTM A 194, Grade 8.

3. Washers: Type 304.

B. Expansion Bolts: Hilti Kwik bolt or equal.

C. Fasteners, Anchors and Bolts:

1. Machine Screws: AISI Type 304 stainless steel conforming to Fed. Spec. FF- S-92a.

2. Stainless Steel Anchor Bolts: ASTM A320 Grade B8, AISI Type 304.
 3. Standard Steel Bolts, Nuts and Washers: ASTM A307.
 4. Sleeve Anchors: Fed. Spec. FF-S-325 Group II, Type 3, Class 3.
 5. High-Strength Structural Steel Bolts, Nuts and Washers: ASTM A 325.
- D. Steel Anchor Bolts: Shapes as indicated, ASTM A 307 with galvanized finish.
1. Headed Stud Type Shear Connectors: Cold Finished carbon steel, ASTM A 668 Class Designation B; similar to Nelson Stud Welding Systems.
 2. Adhesive Anchors: AISI Type 304 stainless steel which meets the requirements of ASTM F593. Anchor rods shall have rolled threads. Threads must be UNC-2A. Adhesive anchors shall be HVA Anchors by Hilti Fastening System, or approved equal.
 3. Dowelling Anchors: Reinforcing steel dowels shall be as specified in Section 03200, Reinforcing Steel. Adhesive material shall conform to ASTM C-881, Type I and II, Grade 2 (horizontal applications) Grade 3 (vertical applications) Class B and C, epoxy resin adhesive. Sikadur 32, Hi-Mod (horizontal) Sikadur 31, Hi-Mod Gel (vertical) as manufactured by Sika Corporation, Fx-775 CM Hydro-Ester (horizontal) Fx-733 Trowel (vertical) as manufactured by Fox Industries, Inc.

2.6 WELDING ELECTRODES AND RODS

- A. Structural Steel: AWS D1.1-86 and AWS A5.1 or AWS A5.5, E70 XX
- B. Stainless Steel: AWS D1.1-86 and AWS A5.4 or AWS A5.9, suitable filler metal for intended usage.
- C. Aluminum: AWS D1.2-83 and AWS A5.10-80, suitable filler metal for intended usage.

2.7 CAST-IRON FRAMES, COVER, AND GRATINGS

Size and type as shown on drawings and as manufactured by Neenah Foundry Co., East Jordan Iron Works, or equal.

2.8 PAINT AND COATINGS

- A. Metal Coatings

Galvanizing: Provide a zinc coating for those items shown or specified to be galvanized as follows:

1. ASTM A53 for galvanizing structural pipes and tubes.
 2. ASTM A153 for galvanizing iron and steel hardware.
 3. ASTM A123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 3.2 mm [1/8"] thick and heavier.
 4. ASTM A123 and A384 for galvanizing assembled steel products.
- B. Galvanized Touch-up: Cold Galvanized Aerosol as manufactured by Rust-O-Leum or approved equal.

2.9 NEOPRENE GASKETS AND SEALING MATERIAL

Type NN-3 1060 Series as manufactured by Williams Products, Inc. or equal.

2.10 ROUGH HARDWARE

- A. Provide bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete and other structures.
- B. Manufacture or fabricate items of sizes, shapes and dimensions required.
- C. Provide malleable iron washers for heads and nuts which bear on wood structural connections: elsewhere furnish steel washers.

2.11 GUARD POSTS

Guard posts shall be welded and seamless painted steel pipe 6 inches diameter, constructed as shown. Steel pipe shall be Type S, Grade A, Schedule 40, conforming to ASTM A53. Pipe shall be filled with concrete in accordance with Section 03300, CAST-IN-PLACE CONCRETE.

2.12 HANDRAILS

- A. Fabricate pipe railings and handrails of materials indicated to design, dimension, and details indicated. Provide railings and handrail members formed of pipe of sizes and wall thickness indicated.
- B. Interconnect railing and handrail members by butt welding or welding with internal connectors at fabricator's option, except as otherwise indicated.

- C. At tee and cross intersections provide coped joints.
- D. At bends, interconnect pipe by means of flush radius bends.
- E. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe at fabricator's option.
- F. Provide wall returns at ends of wall mounted handrails.
- G. Close exposed ends of pipe by welding 4.8 mm [3/16"] thick plate in place or by use of prefabricated fittings.
- H. Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work. Brackets and fittings shall be capable of supporting a concentrated load of 200 pounds in any direction on the rail.

2.13 MANHOLE RUNGS

Where shown, manhole rungs shall be R-1982-W as manufactured by Neenah Foundry Company or equal.

PART 3 - EXECUTION

3.1 FABRICATION

A. General

1. Fabricate all work true to shape, size and tolerances as indicated on the Contract Drawings and approved Shop and Working Drawings; with straight lines, square corners or smooth bends; free from twists, kinks, warps, dents, and other imperfections. Straighten work bent by shearing or punching.
2. Thickness of the metal and details of assembly and support shall provide sufficient strength and stiffness to resist distortion during shipment, handling, installation, and under severe service conditions. Dress exposed edges and ends of metal smooth, with no sharp edges and with corners slightly rounded. Construct connections and joints exposed to weather to exclude water.
3. Provide sufficient quantity and size of anchors for the proper fastening of the work.

B. Connections

1. Shop connections in weldable materials, not designed for service removal, shall be welded. All welding shall conform to AWS Handbook requirements. Weld behind finished surfaces wherever possible. Grind all exposed welds smooth. Remove weld, brazing, and shoulder spatter, flux, slag and oxides from finished surfaces. Use sheet metal lock seams only where indicated on the Contract Drawings or approved Shop and Work Drawings.
 2. Complete all provisions for bolted field connections in the shop unless otherwise indicated.
 3. Burning of holes for bolts in the shop or field will not be permitted; these shall be punched or drilled. Shapes may be cut in the shop by standard flame cutting machines and may be cut in the field only with the written consent of the Owner.
 4. Match exposed work to produce continuity of line and design. Fabricate and fasten metalwork so that the work will not be distorted, the finish impaired, nor the fasteners overstressed from the expansion and contraction of the metal. Conceal fastenings wherever practicable. Use fastenings exposed to public view of the same color and appearance as the surrounding metal.
- C. Castings and Forgings: Fabricated castings and forgings as indicated and true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blowholes and other defects, and with arrisers sharp and perfect. Sandblast castings as required to remove scale and sand and achieve a smooth, clean, uniform surface.
- D. Galvanizing
1. Sheet: ASTM A653.
 2. Process: As specified herein before.
 3. Items to be shop painted which are fabricated without welding entirely from galvanized shapes, hardware and sheet need not be galvanized after fabrication. All other fabrications to be galvanized shall be hot dipped after fabrication.

3.2 ERECTION AND INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment elevation, plumb, level, true and free of rack, measured from established

lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.

- C. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot dip galvanized after fabrication and are intended for bolted or screwed field connections.
- D. Field Welding: Comply with AWS Code for procedures of manual shielded metal arc welding, appearance and quality of welds made and methods used in correcting welding work.
- E. Setting Loose Plates:
 - 1. Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
 - 2. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts and cut off wedges flush with the edge of the bearing plate before packing with grout in concealed locations where not exposed to moisture. Use non-metallic non-shrink grout in exposed locations unless otherwise indicated.
 - 3. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.
- F. Handrails:
 - 1. Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated. Plumb posts in each direction. Secure posts and railing ends to building concrete as follows:
 - 2. Anchor posts to concrete as shown on the drawings.
 - 3. Anchor posts to metal framework as shown on the drawings.
 - 4. Expansion Joints: Provide expansion joints at locations indicated, or if not indicated, at intervals not to exceed 30 feet. Provide slip joint with internal sleeve extended 6" beyond joint on either side. Fasten internal sleeve securely to one side; locate joint within 1'-0" of posts. Railing shall be installed such that the shown gap at the expansion joint exists at the time of installation. Railings shall not be installed when the ambient temperature is less than 30oF.

G. Draw threaded bolt connections up tight with lock washers or other means to prevent loosening. Screw fasteners in exposed or finished surfaces may be slot or Phillips head type, but in either case, screws must be countersunk design.

H. Adhesive anchors shall be installed per manufacturer's recommendations.

3.3 MEASUREMENT AND PAYMENT

A. Components of Metal Fabrication will not be measured, but be paid on the basis of the contract Lump Sum price included with Pipe Support System, complete-in-place. This payment will be for all submittals, materials, tools, equipment, labor, and incidentals necessary to complete the work as shown on the plans.

++ END OF SECTION ++

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SECTION 13467

TEMPORARY BYPASS PUMPING SYSTEMS

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all materials, labor, equipment, including fuel and temporary power to design, install, operate, maintain, and remove temporary bypass pumping systems. Included shall be all pumps, piping, valves, bulkheads, plugs, anchors, supports, blocking, controls, emergency connection systems, engineering, and ancillary items required to complete the Work as described herein and as shown on the Drawings.
- B. A portion of the Work area is subject to flooding. The Contractor shall be responsible for keeping the temporary bypass pumping system operational during periods of flooding and preventing the inflow of storm water from entering manhole openings.
- C. Temporary bypass pumping shall be used during all required interruptions of sanitary sewer service and shall be continuous for the entire period of time that is required to complete the portions of Work for which the sewer requires flow diversion. The Sequence of Construction shall be such that the duration of bypass pumping is minimized.
- D. The Contractor shall be responsible for developing hydraulic design calculations and the design for the temporary bypass pumping system. Hydraulic calculations shall be submitted to Owner and Engineer for approval.
- E. Upon completion of the Work, the Contractor shall remove all temporary bypass pumping system components from the Site.
- F. The temporary bypass pumping systems shall be designed and operated in accordance with the requirements of all codes and regulatory agencies having jurisdiction in the vicinity of the Project Site.
- G. The Contractor shall submit a Bypass Pumping Plan for each bypass pumping system which indicates the following:
 - 1. Pipe material, size and location.
 - 2. Pump performance, size and location.
 - 3. Suction and discharge manholes.
 - 4. Scheduled duration of diversion.
 - 5. Telemetry and security system description.
 - 6. Maintenance plan.
 - 7. Emergency gravity flow connection plan.

- H. No construction of the temporary bypass pumping systems shall begin until all provisions and requirements have been reviewed and approved by the Engineer and Owner. Any leakage or spillage is strictly prohibited.
- I. The Contractor shall submit a spill action plan for approval by the Engineer. The plan shall detail actions to be taken in the event of a sewage spill including, but not limited to, the clean up and removal of sewage and residuals and the application of lime on the contaminated area.
- J. The Contractor shall be prepared to cease temporary diversion pumping activities and reinstate gravity flow in all sewer pipes when flows are anticipated to exceed the capacity of the pumps or conditions prevent the operation of temporary diversion pumping activities. These measures to reestablish gravity flow shall be described in the Bypass Pumping Plan.
- K. Sanitary bypass pumping shall be staffed during operation at all times.

1.2 SYSTEM DESCRIPTION

A. Design Requirements:

1. Provide system of adequate size to ensure that all flows can be safely diverted from the influent manhole(s), around the work area, to a downstream manhole(s).
2. Provide a system to maintain flow around the work area in a manner that will not cause surcharging of sewers, and that will protect public and private property from damage.
3. Temporary bypass pumping system shall be capable of 24-hour per day operation.
4. The temporary bypass pumping system shall be designed to convey peak flows.
5. The temporary bypass pumping system shall include one (1) standby pump capable of conveying a flow equal to the capacity of the largest duty pump at the actual system hydraulics.
6. The standby pump shall be installed adjacent to the duty pumps and shall have suction and discharge piping installed and ready for use.
7. Each pump shall have an individual suction pipe.
8. The discharge pipes for the duty and standby pumps shall be piped to forcemain(s) via manifold(s) with each pump individually isolated by a check valve and shutoff valve.
9. Each pumping system shall be housed in a sound-dampening enclosure. Noise levels shall be limited to less than 69 dBA at full load as measured at the Limits of Disturbance. The Contractor shall comply with all provisions of the City of Alexandria Noise Ordinance.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Pumps:

1. Fully automatic self-priming units that do not require the use of foot- valves in the priming system. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of wastewater flows.
2. Designed for continuous duty operation in air for application in a temporary bypass pumping system.
3. Must handle solids of up to 3-inches in diameter.
4. Do not overload the engines/motors at any point on the pump performance curve throughout the specified speed range.
5. Standby pump shall be connected to the system and shall be kept on-line.
6. Pumps must be adequately supported or secured.
7. Provide pumps with pressure taps and appropriate gauges on the discharge outlets. Locate gauges as close as possible to the pump casing point of discharge.
8. Manufacturers:
 - a. Godwin Pumps of America, Inc.
 - b. Sunbelt Rentals
 - c. Rain for Rent
 - d. Thompson Pump
 - e. Or Approved Equal.

B. Suction Piping:

1. Provide straining/screening as necessary.
2. Furnish with quick connect couplings for emergency pump switch-out as needed.

C. Discharge Piping:

1. Shall be temporarily constructed of rigid pipe with positive, restrained joints.
2. Provide isolation and check valves for each pump.

D. Forcemain Piping:

1. Forcemain piping shall be continuous weld SDR 26 HDPE, Or Approved Equal.

E. Control, Telemetry and Alarm System:

1. Pumps shall be capable of running in automatic and hand mode.
2. In automatic modes, the pumps shall be controlled through the use of floats or other liquid level measurement systems.
3. If floats are used, they shall be clean and maintained weekly.
4. Liquid level measurement systems shall be utilized to operate pumps and to activate an alarm on rising sewage level at the suction manhole(s).
5. The control system shall activate an alarm upon pump failure.

6. Provide remote telemetry system dedicated to the temporary bypass pumping systems.
7. Each pumping system shall include necessary provisions (i.e. autodialer) to immediately notify the Contractor and Owner of alarm conditions.

F. Security:

1. Pumps shall be located in a secure, fenced area.

2.2 SPARE PARTS

- A. Provide Manufacturer recommended spare parts on Site during all operation of temporary bypass pumping systems.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify all dimensions and conditions relative to the performance of the temporary bypass pumping system.
- B. All labor, materials, tools, equipment and/or temporary facilities required during the performance of the Work shall be provided at no additional cost to the Owner.

3.2 PREPARATION

- A. The Contractor shall clean all pipe and manholes if they are found to contain grit, sludge or any blockage that will hinder the operation and maintenance of the equipment.
- B. Sound attenuation measures/structures shall be installed in accordance with Paragraph 1.02 of this Specifications Section and prior to the start-up of the temporary bypass pumping system.
- C. Locate existing utilities in the area of the temporary bypass pumping Equipment.

3.3 INSTALLATION

- A. Install equipment in accordance with the approved Shop Drawings and the Manufacturer's installation instructions.
- B. Locate all piping, pumping, and electric equipment so as to provide the least amount of disruption to normal construction activities.
- C. Provide a pressure gauge in the discharge piping from each pump for startup testing.

- D. All pipe joints shall be free of leakage.
- E. All piping, hoses, and connections shall be secured and durable.
- F. Provide piping supports and thrust blocking at all changes of direction.
- G. Temporarily remove existing manhole frame and covers and sections or make connections to the existing sewer as may be required to provide adequate suction piping. The Contractor shall not modify the top of new manholes that have been tested and placed into service.
- H. 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 the Work, it shall 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.
- I. The pipeline must be located off streets and sidewalks and off shoulders of roads, unless approved by the Engineer.

3.4 FIELD QUALITY CONTROL

A. Testing:

1. Test capacity of each pump operating independently and in parallel with other pumps to verify capacity prior to any temporary pump-around operation. Measure pump discharge pressure to determine pump capacity.

B. Field Testing:

1. Perform leakage tests at full range of operating pressures of the pump-around discharge piping using clean water from tank truck or other clean water source prior to actual operation with sewage.
2. Provide 24 hours advance Notice to the Engineer prior to testing.
3. Operate pumps in the hand and automatic modes.
4. Pump test to include monitoring of discharge pressure.
5. Leakage from pipes or pumps is strictly prohibited. Any leakage, including the low volume “spit” that may be released from the dry-prime vacuum system or other system must be captured and properly disposed.

3.5 SYSTEM STARTUP AND COMMISSIONING

- A. The first set-up shall demonstrate 4 hours of continuous satisfactory pumping prior to the start of excavation of the first section of Work which will render the existing gravity sewer system inoperable. On subsequent set-ups, utilizing the same temporary

bypass pumps and personnel, the Contractor shall demonstrate 2 hours of continuous satisfactory pumping prior to any Work which will render the existing sewer system inoperable.

3.6 MAINTENANCE

- A. Continuous monitoring of the temporary bypass pumping system is required while the system is operational. In the event of an alarm condition, the telemetry system shall notify a designated employee to report to the Site.
- B. The employee shall be a skilled mechanic thoroughly trained in the operation and maintenance of the various temporary bypass pumps and shall be capable of emergency repairs.
- C. The employee shall physically inspect and ensure proper operating condition of the temporary bypass pumping system on an hourly basis to ensure that the system is working correctly.
- D. Sufficient repair parts, tools, and equipment shall be available at all times on-Site to assure rapid emergency troubleshooting and repair of any pump or equipment.
- E. Adequate hoisting equipment for each pump and accessories shall be maintained on the Site.

3.7 SYSTEM DE-COMMISSIONING AND REMOVAL

- A. When removing piping or equipment from service, the Contractor shall flush all temporary bypass piping with water and allow the piping to drain naturally or be pumped to its lowest level prior to disassembly. All remaining fluids shall be removed by the Contractor at no additional cost to the Owner. Solids shall be disposed of off-Site by the Contractor at no additional cost to the Owner. Disposal of these solids must be in accordance with federal, state and local codes.
- B. Following the completion of the temporary bypass pumping operation, disturbed manholes utilized during pump around operations shall be restored to their original condition. Likewise, all other areas impacted by temporary bypass pumping operations shall be re-graded and restored to their original condition.

3.8 LEAKAGE, SPILLS AND DAMAGES

- A. Leakage of sewage and sewage spills are strictly prohibited. The Contractor shall be responsible for compliance with all permit regulations, and shall immediately respond with necessary equipment to stop all leaks and spills of sewage and clean up spillage due to human or mechanical failure. The Contractor shall be responsible for all damage.

- B. The Contractor shall be responsible for all physical damage to facilities, customers or the environment caused by human or mechanical failure.
- C. The Contractor shall be responsible for all expenses accrued by Owner for sewage cleanup.
- D. In the event of a sewage spill, the Contractor shall comply with the approved spill action plan.

3.9 MEASUREMENT AND PAYMENT

- A. Components of Temporary Bypass Pumping Systems will not be measured, but be paid on the basis of the contract Lump Sum price, complete-in-place. This price shall include all labor, materials, equipment necessary for installing temporary bypass pumping station including: moving, removing and maintaining the Temporary Bypass Pumping systems and all incidental work.

+ + END OF SECTION + +

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SECTION 15051

BURIED PIPING INSTALLATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to install and test all buried piping, fittings, and specials. The Work includes, but is not limited to, the following:
 - a. All types and sizes of buried piping, except those specified under other Sections.
 - b. Work on or affecting existing piping.
 - c. Cleaning and disinfecting.
 - d. Installation of all jointing and gasketing materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to complete the buried piping installation.
 - e. Incorporation of valves, meters and special items shown or specified into the piping systems as required and as specified in the appropriate Division 15 Sections.
 - f. Unless otherwise specifically shown, specified, or included under other Sections, buried piping installation includes all buried piping Work required, beginning at the outside face of manholes or structures.
2. All work shall comply with City Standards.

B. Coordination:

1. Review installation procedures under other Sections and coordinate with the Work that is related to this Section.
2. Section 15051 specifies the installation of all buried piping materials specified in Division 15. Coordinate with these Sections.

C. Related Work Specified Elsewhere:

- | | |
|------------------|---|
| 1. Section 02200 | Earthwork, Excavation, Trenching and Backfill |
| 2. Section 02710 | Sanitary Sewers and Appurtenances |
| 3. Section 15053 | Ductile Iron Piping |

1.2 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. Refer to the General and Supplementary Conditions regarding permit requirements for this Project.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
 1. ASTM B 32, Solder Metal.
 2. ASTM C 923, Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
 3. AWWA C111, Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 4. AWWA C606, Grooved and Shouldered Joints.
 5. AWWA M11, Steel Pipe - A Guide for Design and Installation.
 6. AWWA M23, PVC - Design and Installation.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
 1. Laying schedules for all pipe.
 2. Full details of piping, specials, manholes, joints, harnessing and thrust blocks (if allowed), and also connections to existing piping, structures, equipment and appurtenances.
 3. Manufacturer's recommended installation techniques, including manufacturer's recommended sealants, lubricants, etc.
- B. Tests: Submit description of proposed testing methods, procedures and apparatus. Prepare and submit report for each test.
- C. Certificates: Submit certificates of compliance with referenced standards.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the Work. Materials received from factory shall be in new, undamaged condition. Materials cracked, gouged, chipped, dented or otherwise damaged will not be acceptable and shall be removed from the site immediately.
- B. Handle all pipe, fittings, specials and accessories carefully with approved handling devices. Do not drop or roll material off trucks. Do not otherwise drop, roll or skid piping. Materials cracked, gouged, chipped, dented or otherwise damaged will not be acceptable and shall be removed from the site immediately.
- C. Unload pipe, fittings and specials opposite to or as close to the place where they are to be installed as is practical to avoid unnecessary handling. Keep pipe interiors completely free from dirt and foreign material.

- D. Provide covered storage for all thermoplastic and ultraviolet sensitive piping and accessories.
- E. All gaskets, seals and other resilient materials shall be stored in a protective environment in accordance with manufacturers' recommendations.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

- A. Pipe materials required are listed in the "Buried Piping Schedule" at the end of this Section. Refer to applicable Sections for pipe materials Specifications.
- B. General:
 - 1. Pipe Marking:
 - a. Clearly mark each piece of pipe or fitting with a designation which conforms with those shown on the laying schedule.
 - b. Cast or paint material, type and class designation on each piece of pipe or fitting 4 inches in diameter and larger.

2.2 PIPE TRENCH AND BEDDING MATERIALS

- A. Pipe trench and bedding materials shall be provided as specified and shown in the construction documents.

2.3 BURIED PIPING SCHEDULE

- A. Attached at the end of this Section is the "Buried Piping Schedule." Conform to requirements of the Schedule, unless otherwise specified or approved by ENGINEER.

PART 3 - EXECUTION

3.1 GENERAL

- A. Pipe trench and bedding installation details shall be provided as specified and shown in design documents.
- B. Install piping as shown, specified and as recommended by the manufacturer.
- C. Request instructions from ENGINEER before proceeding if there is a conflict between the manufacturer's recommendations and the Drawings or Specifications.

- D. All trench excavations shall be inspected by ENGINEER prior to laying pipe. Notify ENGINEER in advance of excavating, bedding and pipe laying operations.
- E. Pipe, fittings, specials and accessories that are cracked, damaged or in poor condition or have damaged linings will be rejected.
- F. All pipelines connecting to structures shall be provided with a flexible pipe joint connection within two (2) feet of the structure.
- G. Connections to Existing Sewers:
 - 1. All taps to existing sewer mains or lines are to be made under the authority of the required permit issued by the City of Alexandria Department of Transportation and Environmental Services.
 - 2. Taps are to be made by the CONTRACTOR at the CONTRACTOR's option and expense.
 - 3. All taps are to be paid for by the CONTRACTOR at prevailing established prices on file at the City offices. This cost shall be included in the CONTRACTOR's unit price bid for accessories.
 - 4. Note that some pipe materials require special manufacturer's services for tapping. CONTRACTOR shall include all costs for such services in the price bid for accessories.
 - 5. CONTRACTOR shall test any existing system being connected to, prior to connection main.
- H. Closures: Provide all closure pieces shown or required to complete the Work.

3.2 MANUFACTURER'S INSTALLATION SPECIALIST

- A. CONTRACTOR shall provide the services of a competent installation specialist of the pipe manufacturer when pipe laying commences when requested by the ENGINEER.
- B. Retain installation specialist at the job site for a minimum of 1 day or until competency of the pipe laying crew has been satisfactorily demonstrated.

3.3 PIPE SEPARATION

- A. Regardless of service or condition of pipe, a minimum vertical separation of eighteen (18) inches shall be maintained between all pipe trenches that intersect to any degree except as discussed below for potable water mains and services.
 - 1. If the minimum cannot be maintained, the CONTRACTOR shall submit details to the ENGINEER for approval to support the pipe crossing and prevent any long-

term settlement and damage to either pipe. At a minimum, cradles shall be used to support upper pipe.

2. All costs to maintain this specified separation shall be at the CONTRACTOR's expense.

B. Separation of Potable Water Mains from Sewer Mains and Services:

1. Parallel installations shall comply with the following:

- a. Normal Conditions: Water mains shall be at least ten (10) feet horizontally from any sanitary sewer, storm sewer or sewer manhole, whenever possible. The distance shall be measured edge-to-edge.
- b. Unusual Conditions: If local conditions prevent a horizontal separation of ten (10) feet or greater and the ENGINEER approves the installation, the horizontal distance between a water main and a storm or sanitary sewer may be less than ten (10) feet provided that:

- 1) The bottom of the water main is at least eighteen (18) inches above the top of the sewer for the entire length required;

- a) Where this vertical separation cannot be provided, the sewer shall be constructed (or reconstructed) of materials and joints meeting City standard specifications for water main standards for the entire length required. The sewer shall be pressure-tested to assure water-tightness prior to backfilling in compliance with City standard specifications.

2. Crossing installations shall comply with the following:

- a. Normal Conditions: Water mains crossing house sewers, storm sewers or sanitary sewers shall be laid to provide a separation of at least eighteen (18) inches between the bottom of the water main (above) and the top of the sewer (below), whenever possible.
- b. Unusual Conditions: If local conditions prevent a vertical separation as described above, and the ENGINEER approves the installation, the following construction shall be used:

- 1) Sewers passing over water mains shall be constructed (or reconstructed) of the materials and joints meeting City standard specifications for water main standards for the entire length required. The sewer shall be pressure-tested to assure water-tightness prior to backfilling in compliance with City standard specifications.

- 2) Water mains passing under sewers shall, in addition to the above, be protected by providing:

- a) A vertical separation of at least eighteen (18) inches between the bottom of the sewer (above) and the top of the water main (below);

- b) Adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking the water mains;
 - c) A water main layout such that a full length section of water main piping is centered at the point of crossing so that the joints will be equi-distant and as far as possible from the sewer.
- C. Separation of Water Service Lines: Along the route of the water service pipe from the water main to the water meter, the following criteria shall be met:
- 1. Water and sewer service lines shall have ten (10) feet minimum horizontal separation or eighteen (18) inches vertical separation.
 - 2. When installed in the same trench, water service shall be above the sewer service (shelved in trench) and separated by the minimum vertical separation.
 - 3. Fire and domestic water service lines shall have a minimum three (3) feet horizontal separation.

3.4 PLUGS

- A. Temporarily plug installed pipe at the end of each day's work or other interruption to the installation of any pipe line. Plugging shall be adequate to prevent the entry of animals, liquids or persons into the pipe or the entrance or insertion of deleterious materials.
- B. Install standard plugs into all bells at dead ends, tees or crosses. Cap all spigot ends.
- C. Fully secure and block all plugs and caps installed for pressure testing to withstand the specified test pressure.
- D. Where plugging is required for contract division or phasing of the Work for later connection, install watertight, permanent-type plugs.

3.5 BACKFILL AND BEDDING OF PIPE

- A. Trench excavation, backfill and bedding materials shall conform to the requirements of Section 02200.
- B. Where the existing trench bottom is deemed unsuitable by ENGINEER, remove and replace it with approved gravel backfill. Payment for the additional excavation and gravel backfill will be made at the unit prices bid if provided in the Bid Form. See Section 02200.
- C. Where pipe is installed in rock excavation, provide a minimum of 6-inches of crushed stone or gravel.
- D. Excavate trenches below the pipe bottom by an amount shown and specified. Remove all loose and unsuitable material from the trench bottom.

- E. Do not lay pipe until the ENGINEER approves the bedding condition. If a conflict exists obtain clarification from ENGINEER before proceeding.
- F. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.

3.6 LAYING PIPE

- A. Conform to manufacturer's instructions and requirements of the standards listed below, where applicable:
 - 1. Ductile Iron Pipe: AWWA C600, AWWA C105.
- B. Install all pipe accurately to line and grade shown unless otherwise approved by ENGINEER. Remove and relay pipes that are not laid correctly.
- C. Slope piping uniformly between elevations shown.
- D. Ensure that ground water level in trench is at least 6 inches below bottom of pipe before laying piping. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete.
- E. Start laying pipe at lowest point and proceed towards the higher elevations, unless otherwise approved by ENGINEER.
- F. Place bell and spigot pipe so that bells face the direction of laying, unless otherwise approved by ENGINEER.
- G. Excavate around joints in bedding and lay pipe so that only the barrel receives bearing pressure from the trench bottom.
- H. Deflections at joints shall not exceed 75 percent of the amount allowed by the pipe manufacturer unless specified in the joint deflection tables at the end of this Section.
- I. Carefully examine all pipe, fittings and specials for cracks, damage or other defects while suspended above the trench before installation. Immediately remove defective materials from site.
- J. Inspect interior of all pipe and fittings and completely clean all dirt, gravel, sand, debris or other foreign material from pipe interior before it is moved into the trench. Bell and spigot mating surfaces shall be thoroughly wire brushed and wiped clean and dry immediately before the pipe is laid.
- K. Field cut pipe, where required, with a machine specially designed for cutting piping. Make cuts carefully, without damage to pipe or lining, and with a smooth end at right

angles to the axis of pipe. Cut ends on push-on joint shall be tapered and sharp edges filed off smooth. Flame cutting will not be allowed.

- L. Blocking under piping will not be permitted unless specifically approved by ENGINEER for special conditions. If permitted, conform to requirements of AWWA C600.
- M. Touch up protective coatings in a satisfactory manner prior to backfilling.
- N. Provide polyethylene encasement for ductile iron piping to prevent contact between the pipe and surrounding bedding material and backfill.
- O. Provide a 12 gauge solid copper insulated tracer wire, terminated at each valve, to allow electronic detection of PVC or polyethylene force mains while not damaging the force main in any way. Wire shall be secured to the outside top of the pipe at a minimum 5 foot spacing. Splices in the wire shall be made using watertight connectors. Tracer wire shall be installed on all PVC or polyethylene force mains.
- P. CONTRACTOR shall notify ENGINEER in advance of backfilling operations schedule.
- Q. On steep slopes take measures acceptable to ENGINEER to prevent movement of the pipe during installation.
- R. Thrust Restraint: During the installation of the pipe, thrust restraint systems shall be provided wherever required for thrust restraint. Thrust restraint shall conform to the applicable requirements of paragraph 3.9.
- S. Field welding for any purpose shall not be permitted unless approved by the ENGINEER.

3.7 JOINTING PIPE

- A. Ductile Iron Mechanical Joint Pipe:
 1. Completely clean all jointing surfaces and adjacent areas immediately before making joint.
 2. Lubricate the bell socket and insert the gasket, making sure that it faces the proper direction and is correctly seated.
 3. Lubricate the gasket and the plain end of the pipe.
 4. Clean and lubricate bolt threads.
 5. Center the plain end and push into the bell. After the gasket is compressed and before pipe is brought fully home, carefully check the gasket for proper position around full circumference of the joint. If correct, the pipe shall be shoved home. The gland shall then be slid to the bell for bolting. All bolts shall be alternately tightened 180 degrees opposite to each other in incremental steps up to the

maximum torque in accordance with the pipe manufacturer's recommendations to seat the gasket evenly. The bolt torque shall be as follows:

Bolt Size (Inches)	Applied Torque (ft-lbs)	Length of Wrench (inches)
5/8	50	8
3/4	80	10
1	90	14
1 -1/4	110	16

6. Conform to requirements of AWWA C111 and the manufacturer's recommendations pertaining to jointing pipe.
7. Deflect pipe joints where required to effect bends in the pipeline alignment. Pipe joint deflection and offset shall be limited to values given in the Mechanical Joint Pipe Deflection Table at the end of this Section.

B. Ductile Iron Push-On Joint Pipe:

1. Prior to assembling the joints, the last 8 inches of the exterior surface of the spigot and the interior surface of the bell shall be thoroughly cleaned with a wire brush, except where joints are lined or coated with a special protective lining or coating.
2. Rubber gaskets shall be wiped clean and flexed until resilient. Refer to manufacturer's instructions for procedures to be used to ensure gasket resiliency when assembling joints in cold weather.
3. Smooth out the entire circumference of the gasket to remove bulges and to prevent interference with the proper entry of the spigot of the entering pipe.
4. Immediately prior to joint assembly, a thin film of approved lubricant shall be applied to the surface of the gasket which will come in contact with the entering spigot end of pipe. CONTRACTOR may, at his option, apply a thin film of lubricant to the outside of the spigot of the entering pipe.
5. For assembly, center spigot in the pipe bell and push pipe forward until it just makes contact with the rubber gasket. After gasket is compressed and before pipe is pushed or pulled all the way home, carefully check the gasket for proper position around the full circumference of the joint. Final assembly shall be made by forcing the spigot end of the entering pipe past the rubber gasket until it makes contact with the base of the bell. When more than a reasonable amount of force is required to assemble the joint, the spigot end of the pipe shall be removed to verify the proper positioning of the rubber gasket. Gaskets which have been scoured or otherwise damaged shall not be used.
6. Maintain an adequate supply of gaskets and joint lubricant at the site at all times when pipe jointing operations are in progress.
7. Use wood blocking between the end of pipe and the mechanical application of force to seat the pipe joint. Do not apply mechanical force directly to the end of the pipe.

8. Deflect pipe joints where required to effect bends in the pipeline alignment. Pipe joint deflection and offset shall be limited to values given in the Push-On Joint Pipe Deflection Table at the end of this Section.

C. Proprietary Joints:

1. Pipe which utilizes proprietary joints such as Fastite, by American Cast Iron Pipe Company, Tyton by U.S. Pipe Incorporated, Style 44 by Victaulic, restrained joints described under Paragraph 3.9., or other such joints shall be installed in strict accordance with the manufacturer's instructions. CONTRACTOR shall provide a minimum three copies of manufacturers instructions to the ENGINEER prior to the start of construction.

D. Flanged Joints:

1. Assemble flanged joints using 1/8-inch thick gaskets. Gaskets shall be suitable for the service intended in accordance with the manufacturer's ratings and instructions. Gaskets shall be properly centered.
2. Provide bolts in accordance with ASTM C 307 and tighten in a sequence which will insure equal distribution of bolt loads. Torque bolts in incremental steps up to the following limits:

Pipe Size (in.)	Torque (ft-lbs)
18	300

3. The length of bolts shall be uniform, and they shall not project beyond the nut more than 1/4 inch or fall short of the nut when fully taken up. The ends of bolts shall be machine cut so as to be neatly rounded. No washers shall be used.
4. Bolt threads and gasket faces for flanged joints shall be lubricated.

3.8 CORROSION CONTROL

- A. Provide polyethylene encasement corrosion control for all iron piping and iron or steel appurtenances associated with concrete piping.
- B. Provide polyethylene encasement for piping to prevent contact between the pipe (or exposed iron/steel) and surrounding bedding material and backfill.
 1. Polyethylene shall be supplied in tubes or in sheet material.
 2. Polyethylene encasement materials and installation shall be in accordance with the requirements of AWWA C105.
- C. Provide cathodic protection, test stations and bonding straps across joints in accordance with the Drawings. Field welded bonding straps shall not be used unless approved by the ENGINEER.

3.10 WORK AFFECTING EXISTING PIPING

A. Location of Existing Piping:

1. Locations of existing piping shown should be considered approximate.
2. CONTRACTOR is responsible for determining the true location of existing piping to which connections are to be made, and location of other facilities which could be disturbed during earth moving operations, or which may be affected by CONTRACTOR's Work in any way.
3. Conform to applicable requirements of Division 1 which pertain to cutting and patching and connections to existing facilities.

B. Connecting to Existing Piping

1. Buried piping may not be restrained in accordance with existing regulations. If the installation is per older regulations:
 - a. thrust restraint may be accomplished by:
 - 1) replacing non-restrained fittings and pipe with restrained fittings back to the required distance or
 - 2) when replacement is not practical, due to not being able to take the line out of service or the existing valves not shutting down the line, up to a twelve (12") inch line, use three-quarter (3/4") inch stainless steel threaded rods with stainless steel nuts and washers. The restraint must be either connected in two places to a restrained portion of the system or the two rods connected to a fixture using a perpendicular member of the system to restrain the new system. The rods would be connected to an appropriate restraint on the new system. If pipe is larger than twelve (12") inches engineering approval is required.

3.11 FINISHES/COATINGS

A. Buried or submerged pipe coatings and finishes, both interior and exterior of the pipe, shall be provided as specified in the appropriate Section and as scheduled in the "Buried Piping Schedule" at the end of this Section. For situations where piping is exposed inside structures, pits, etc., paint the pipe exterior as specified below.

B. Exposed Piping Painting:

1. Paint all exposed piping, supports, and appurtenances shown on the Drawings in accordance with methods approved by the paint manufacturer and the minimum surface preparation stated below. The CONTRACTOR shall submit color chip samples for approval prior to construction.
2. Surface Preparation:
 - a. Ferrous Metals: SSPC-SP 6 Commercial Blast Cleaning.

- b. Galvanized and Non-Ferrous Metal: SSPC-SP 1 Solvent Cleaning.
3. Product and Manufacturer: Provide one of the following:
- a. Kop-Coat:
 - 1) Primer: 340 Gold - 2 coats, 2.0 dry mils per coat, 527 square feet per gallon per coat.
 - 2) Intermediate: Hi-Gard - 1 coat, 2.0-3.0 dry mils, 250-370 square feet per gallon.
 - 3) Finish: 1122BRS Polyurethane - 1 coat, 1.0-1.5 dry mils, 480- 720 square feet per gallon.
 - b. Tnemec:
 - 1) Primer: 66-1211 Epoxy 2 coats, 1.5-2.5 dry mils per coat, 270- 460 square feet per gallon per coat.
 - 2) Intermediate: 66 H.B. Epoxoline - 1 coat, 2.0-3.0 dry mils, 240-360 square feet per gallon.
 - 3) Finish: 71 Endura-Shield - 1 coat, 1.5-2.5 dry mils, 270-460 square feet per gallon.
 - c. M.A.B.:
 - 1) Primer: Ply-Tile 520-R-17 Epoxy - 2 coats, 1.8-2.2 dry mils per coat, 720 square feet per gallon per coat.
 - 2) Intermediate: Ply-Tile 520 HB Epoxy - 1 coat, 3.0 dry mils, 870 square feet per gallon.
 - 3) Finish: Ply-Thane 800 Urethane - 1 coat, 1.8-2.2 dry mils, 770 square feet per gallon.
 - d. Or approved equal.
- C. Bituminous Coating: Shall be coal tar epoxy applied in accordance with the material manufacturer's recommendations.
- 1. Coal Tar Epoxy shall comply with Corps of Engineers Specification C- 200.

Buried Piping Schedule						
Service	Material	Interior Lining	Exterior Coating	Test Pressure	Remarks	Lateral Connections
Gravity Sanitary Sewer	Ductile Iron Pipe	Ceramic Epoxy	Bituminous Coating and Polyethylene Wrap	Leakage test by exfiltration, infiltration, or air test (thermoplastic pipe criteria). See Section 15075 for allowable leakage rates, test pressures, and durations.		Ductile Iron Fitting
	AWWA C301 Concrete	Coal Tar Epoxy				Factory Manufactured
	ASTM C 76 Concrete	Coal Tar Epoxy (15" \varnothing and larger)				Inserta Tee or Kor-N-Tee
	PVC (up to 15" dia.)				Deflection test required.	PVC Fitting
	PVC (greater than 15" dia.)					Inserta Tee or Kor-N-Tee
	PVC Composite				Deflection test required (may be waived if depth of bury less than 12 feet).	Composite Pipe Fitting

Buried Piping Schedule

Service	Material	Interior Lining	Exterior Coating	Test Pressure	Remarks	Lateral Connections
Gravity Sanitary Sewer (continued)	AWWA C900 and C905 PVC			Leakage test by exfiltration, infiltration, or air test (thermoplastic pipe criteria). See Section 15075 for allowable leakage rates, test pressures, and durations.		Ductile Iron Fitting
	HDPE					Electrofusion Coupling
	Corrugated PE Drainage Pipe				Form storm sewer or temporary sanitary sewer use only.	Manufactured Fitting
	Vitrified Clay			Leakage test by exfiltration, infiltration, or air test (thermoplastic pipe criteria). See Section 15075 for allowable leakage rates, test pressures, and durations.		Vitrified Clay Fitting
Sewer Force Main	Ductile Iron Pipe	Ceramic Epoxy	Bituminous Coating and Polyethylene Wrap	Hydrostatic pressure test at 150% of working pressure.	Test Duration 2 hrs. See Section 15075 for allowable leakage rates.	
	AWWA C301 Concrete	Coal Tar Epoxy				

Buried Piping Schedule

Service	Material	Interior Lining	Exterior Coating	Test Pressure	Remarks	Lateral Connections
Sewer Force Main (continued)	AWWA C900 PVC (4" to 12" dia.)			Hydrostatic pressure test at 150% of working pressure.	Test duration 2 hrs. See Section 15075 for allowable leakage rates.	
	HDPE					

Mechanical Joint Pipe Deflection Table (Ductile Iron Pipe)				
Size of Pipe (inches)	Maximum Permissible Deflection Per length (inches)			
	12 ft. Length	16 ft. Length	18 ft. Length	20 ft. Length
3	20 - 1/2	27-1/2	31	35
4	20 - 1/2	27-1/2	31	35
6	18	24	27	30
8	13	18	20	22
10	13	18	20	22
12	13	18	20	22
14	9	12	13-1/2	15
16	9	12	13-1/2	15
18	7-1/2	10	11	12
20	7-1/2	10	11	12
24	6	8	9	10
30	6	8	9	10
36	5-1/2	7	8	9
42	5	6-1/2	7-1/2	8
48	5	6-1/2	7-1/2	8

Push-On Joint Deflection Table (Ductile Iron Pipe)				
Size of Pipe (inches)	Maximum Permissible Deflection Per length (inches)			
	12 ft. Length	16 ft. Length	18 ft. Length	20 ft. Length
3	12	17	19	21
4	12	17	19	21
6	12	17	19	21
8	12	17	19	21
10	12	17	19	21
12	12	17	19	21
14	7-1/2	10	11	12
16	7-1/2	10	11	12
18	7-1/2	10	11	12
20	7-1/2	10	11	12
24	7-1/2	10	11	12
30	7-1/2	10	11	12
36	7-1/2	10	11	12
42	5	6-1/2	7-1/2	8
48	5	6-1/2	7-1/2	8
54	3-1/2	4-1/2	5-1/2	6

++ END OF SECTION ++

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SECTION 15053

DUCTILE IRON PIPE

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish ductile iron pipe and fittings.
2. The extent of the piping is shown on the Drawings and in the schedules included in Section 15051.

B. Related Work Specified Elsewhere:

1. Section 02200, Earthwork, Excavation, Trenching and Backfilling
2. Section 15051, Buried Piping Installation.

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Manufacturer shall have a minimum of 5 years of experience of producing ductile iron pipe and fittings, and shall show evidence of at least 5 installations in satisfactory operation.
2. Ductile iron pipe and fittings shall be the product of one manufacturer.

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

1. ANSI B16.1, Cast Iron Pipe Flanges and Flanged Fittings.
2. ANSI B18.2.1, Square and Hex Bolts and Screws Inch Series, Including Hex Cap Screws and Lag Screws.
3. ANSI B18.2.2, Square and Hex Nuts.
4. AWWA C104, Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.
5. AWWA C105, Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
6. AWWA C110, Ductile Iron and Gray Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
7. AWWA C111, Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.
8. AWWA C115, Flanged Ductile Iron and Gray Iron Pipe with Threaded Flanges.
9. AWWA C150, Thickness Design of Ductile Iron Pipe.

10. AWWA C151, Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand Lined Molds, for Water or Other Liquids.
11. AWWA C153, Ductile-Iron Compact Fittings, 3 in. through 16 in., for Water and Other Liquids.
12. ASTM A304, Alloy Steel Bars Subject to End Quench Hardenability Requirements.
13. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
14. ASTM A354, Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners.
15. ASTM G62, Test Methods for Holiday Detection in Pipeline Coatings.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Detailed drawings and data on pipe, fittings, gaskets and appurtenances. Submit these with Shop Drawings required under Sections 15051.

B. Certificates: Submit certificates of compliance with referenced standards.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Refer to Sections 15051.

PART 2 PRODUCTS

2.1 MATERIALS

A. General

Joints shall be as specified in piping schedules in Sections 15051. If not specified, provide flanged joints for exposed piping and restrained push on or mechanical joints for buried piping. Couplings may be provided on pipe with plain or grooved ends where shown on the Drawings or where approved by ENGINEER.

B. Ductile Iron Pipe and Fittings:

1. Flanged Pipe:

- a. Fabricate in accordance with requirements of AWWA C151.
- b. Thickness: Use Thickness Class 53 for 24" Ø and smaller. Use pressure class design criteria for larger than 24" Ø with approval of ENGINEER.

2. Non Flanged Pipe:

- a. Conform to AWWA C151 for material, dimensions, tolerances, tests, markings and other requirements.
 - b. Thickness: Use Thickness Class 53 for 24" Ø and smaller. Use pressure class design criteria for larger than 24" Ø with approval of ENGINEER.
3. Joints:
- a. Flanged Joints: Conform to AWWA C110 capable of meeting, working and test pressure specified in Section 15051.
 - 1) Gaskets: 1/8 inch thick, full face.
 - a) Water lines: Natural or synthetic rubber.
 - b) Sewer lines: EPDM or Buna-N.
 - 2) Bolts and Nuts: Conform to ANSI B18.2.1 and ANSI B18.2.2, respectively. Exposed bolts and nuts shall be ASTM A 307, Grade B. Buried or submerged bolts and nuts shall be Type 304 stainless steel.
 - b. Mechanical Joints: Conform to AWWA C111.
 - 1) Glands: Ductile iron – Restraining type.
 - 2) Gaskets: Plain Tip.
 - a) Water lines: Conform to AWWA C111.
 - b) Sewer lines: EPDM or Buna-N.
 - 3) Bolts and Nuts: High strength, low alloy steel.
 - c. Push On Joints: Conform to AWWA C111.
 - 1) Gaskets:
 - a) Water lines: Conform to AWWA C111.
 - b) Sewer lines: EPDM or Buna-N.
 - 2) Stripes: Each plain end shall be painted with a circular stripe such that it provides a guide for visual check to determine when the joint is properly assembled.
 - d. Restrained Joints:
 - 1) Restrained joints for mechanical joint piping shall be:

- a) MJ Field Lok gasket by US Pipe and Foundry Co.
 - b) Megalug as manufactured by Ebaa Iron Inc.
 - c) Or equal.
- 2) Restrained joints for push on joint piping shall be:
- a) TR Flex restrained joint pipe and fittings by US Pipe and Foundry Co.
 - b) Lok Ring Joint as manufactured by American Cast Iron Pipe Company.
 - c) Field Lok gasket (identify joint by wrapping the pipe within one (1) foot on each side of joint with 2-inch wide plastic tape noting "FIELD LOK RESTRAINED JOINT" in 1-inch high letters).
 - d) Or equal.
- 3) The length of restrained joint piping on either side of a fitting shall be provided in accordance with the Drawings. If restrained joints are not shown on the drawings, provide restrained joints for all bends and fittings where a change in the direction of flow occurs and for all upstream and downstream joints within the lengths shown in the details at the end of Section 15051. The length of restrained pipe on either side of a valve shall be the same as a plug. All valves with mechanical joint ends shall have restraining type glands.
- 4) Field fabrication of restrained joints shall not be permitted.
4. Flanged fittings: Conform to AWWA C110. Compact fittings may be acceptable if allowed by the ENGINEER.
- a. Pressure Rating: 250 unless otherwise noted.
 - b. Material: Ductile iron or cast iron except compact fittings if allowed shall be ductile iron only.
 - c. Gaskets: As specified above for joints.
 - d. Bolts and Nuts: As specified above for joints.
5. Mechanical Joint Fittings: Conform to AWWA C110. AWWA C153 fittings may be acceptable if allowed by the ENGINEER.
- a. Pressure Rating: 250 unless otherwise noted.
 - b. Material: Ductile iron or cast iron except compact fittings if allowed shall be ductile iron only.
 - c. Glands: Use cast iron glands with cast iron fittings and ductile iron glands with ductile iron fittings. Glands to be restraining type only.
 - d. Gaskets: As specified above for joints.
 - e. Bolts and Nuts: As specified above for joints.
 - f. Mechanical Joint Bolt Holes: Orient bolt holes to straddle vertical centerline of fittings.

C. Specials:

1. Bell and Spigot (Caulked Joint) Fittings: provide where shown on the Drawings.
2. Transition Pieces:
 - a. Furnish suitable transition pieces (adapters) for connections to existing piping.
 - b. Unless shown on Drawings, CONTRACTOR shall expose existing piping to determine material, dimensions and other data required for transition pieces.
3. Taps: Provide taps where shown or required for small pipe connections. Where pipe or fitting wall thickness is too small to provide required number of threads, pipe saddle shall be installed.
4. Field Installed Flanges:
 - a. Provide Series 400 flange adapters by "Uni-Flange" Corporation.
 - b. Install flanges only in locations shown, specified or approved by the ENGINEER.

2.2 MARKING FOR IDENTIFICATION

- A. All pipeline materials shall be stamped, marked or identified with the following:
1. Name or trade mark of the manufacturer.
 2. Pipe class.
 3. Size and length dimensions.
 4. Date and place of manufacture.

2.3 FINISHES, COATINGS AND LININGS

- A. Clean and prime coat surfaces of exposed piping in the shop in accordance with the requirements of Section 15051.
1. Field painting and coverage is under Section 15051.
- B. Buried pipe and fittings shall be shop-coated on the outside with a bituminous coating, approximately 1 mil thick conforming to AWWA C110.
- C. Pipe and fittings shall also be encased in a polyethylene tube meeting the requirements of AWWA C105.
- D. Pipe and fittings shall be lined with a bituminous seal coated cement mortar lining in accordance with AWWA C104 unless otherwise specified or shown.
- E. Ductile iron pipe and fittings used for sanitary sewers and force mains shall be coated on the interior with a ceramic epoxy lining. Delete cement lining for sanitary sewers and force mains.

1. Pipe and fittings shall have an interior lining of ceramic epoxy with sufficient additives to resist ultraviolet exposure during above-ground storage.
2. Prior to the application of the lining, each length of pipe and fitting shall be cleaned by grinding and shot blasting to assure that a clean metal surface is available for a proper bonding of the lining.
3. The lining shall cover the surface from the plain or beveled end to the gasket recess in the bell.
4. An overcoat of mastic shall be applied to the exterior of the plain or beveled end and to the bell socket.
5. Nominal thickness of the lining shall be 40 mils, and minimum shall be 35 mils. Lining thickness may taper for a distance of 2" to a minimum thickness of 30 mils at ends of pipe and fittings.
6. Each length of lined pipe or fitting shall be visually inspected by a qualified inspector, and shall be systematically tested for holidays in accordance with ASTM G62, using a high voltage testing device. Any lining failing the holiday test shall be repaired and retested.
7. The lining material shall be Protecto 401 or approved equal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. For buried piping installation, see Section 15051.

3.2 INSPECTION

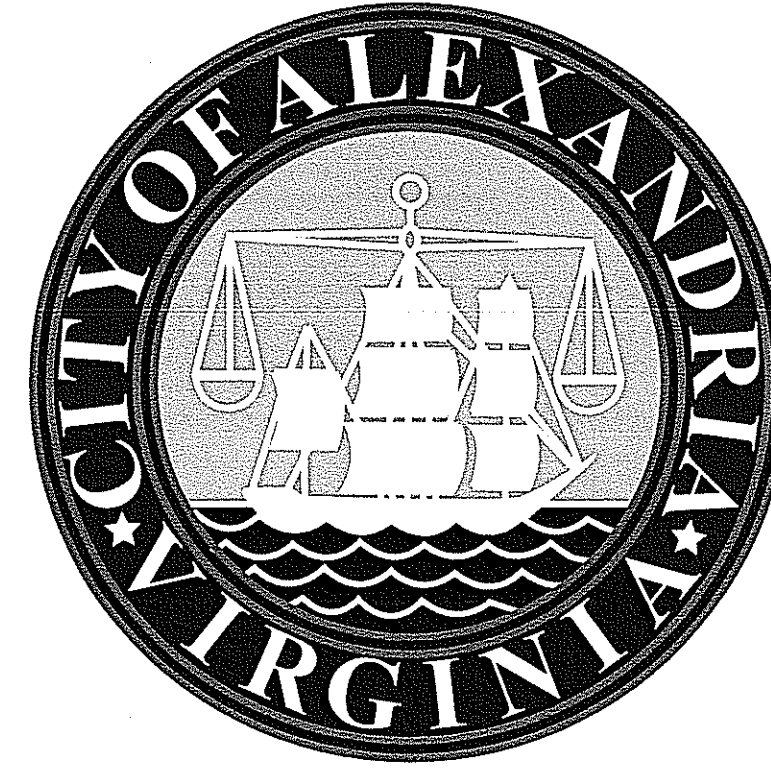
- A. CONTRACTOR shall inspect all piping to assure that piping is free from defects in material and workmanship. The compatibility of all pipe, fittings and coatings shall be verified by the CONTRACTOR.
- B. OWNER reserves right to reject workmanship tolerances, out-of-round, or defective lining of all pipe, fittings and specials delivered to the site.
- C. CONTRACTOR shall bear all costs to demonstrate tolerances are acceptable to the OWNER.

3.3 MEASUREMENT AND PAYMENT

- A. For measurement and payment, refer to section 02710 Sanitary Sewers and Appurtenances.

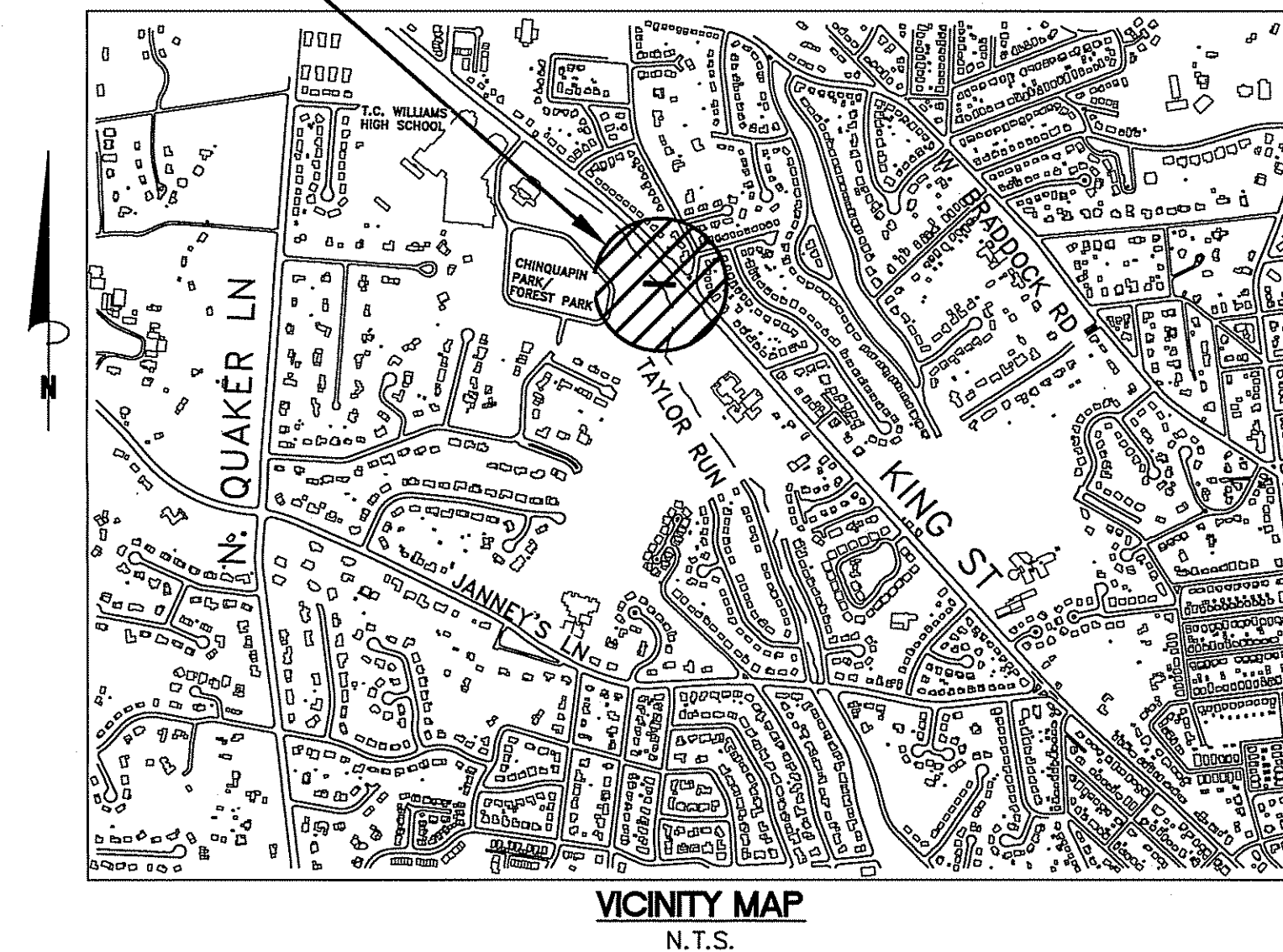
++ END OF SECTION ++

CITY OF ALEXANDRIA, VIRGINIA



TAYLOR RUN SANITARY SEWER CROSSING REPAIR PROJECT NO. 11-105

PROJECT LOCATION



VICINITY MAP
N.T.S.

PROJECT DESCRIPTION:

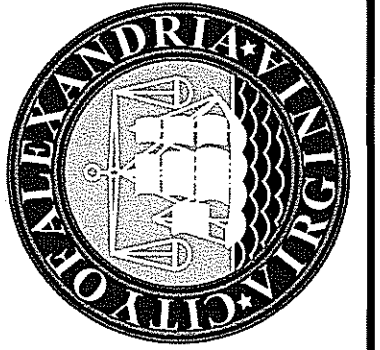
THIS PROJECT INCLUDES THE REPAIR AND PROTECTION OF A SANITARY SEWER STREAM CROSSING WHICH HAS EXPOSED LINER. THE DAMAGE CONSISTED PRIMARILY OF THE EXPOSED LINER LOCATED IN THE TAYLOR RUN CHANNEL, APPROXIMATELY 100 FEET, BEHIND CHINQUAPIN RECREATION CENTER NEAR CHINQUAPIN DR. AND KING ST.

SHEET INDEX		
SHEET NO.	DRAWING NUMBER	SHEET NAME
1	C-01	COVER SHEET
2	C-02	GENERAL NOTES
3	C-03	SITE ACCESS PLAN
4	C-04	EXISTING CONDITIONS PLAN
5	C-05	SANITARY SEWER PLAN AND PROFILE
6	C-06	SEAWALL PLAN AND SECTIONS
7	C-07	CIVIL DETAILS
8	C-08	EROSION AND SEDIMENT CONTROL NOTES
9	C-09	EROSION AND SEDIMENT CONTROL PLAN
10	C-10	EROSION AND SEDIMENT CONTROL DETAILS



DEPARTMENT OF TRANSPORTATION & ENVIRONMENTAL SERVICES.	
APPROVED X <i>[Signature]</i> DIRECTOR	DATE: 4/17/15
RECOMMENDED FOR APPROVAL X <i>[Signature]</i> DEPUTY DIRECTOR OF OPERATIONS	DATE: 5/18/15
RECOMMENDED FOR APPROVAL X <i>[Signature]</i> DEPUTY DIRECTOR OF INFRASTRUCTURE & ENVIRONMENT	DATE: 5/12/15
RECOMMENDED FOR APPROVAL X <i>[Signature]</i> DEPUTY DIRECTOR OF TRANSPORTATION	DATE: 5/12/15
DEPARTMENT OF PROJECT IMPLEMENTATION	
APPROVED X <i>[Signature]</i> DIRECTOR	DATE: 4/17/15
RECOMMENDED FOR APPROVAL X <i>[Signature]</i> DIVISION CHIEF CONSTRUCTION	DATE: 5/18/15

100% SUBMITTAL



CITY OF ALEXANDRIA, VIRGINIA
DEPARTMENT OF PROJECT IMPLEMENTATION
301 KING STREET
ALEXANDRIA, VIRGINIA 22313

DATE	REVISIONS BY	DESCRIPTION

ALEXANDRIA PROJECT NO.: 11-105
DATE OF PLAN ISSUANCE: 4/17/15
CONSULTANT PROJECT ID:
DESIGNED BY: CJB DATE: 4/17/15
DRAWN BY: CJB DATE: 4/17/15
CHECKED BY: AG DATE: 4/17/15
APPROVED BY: MB DATE: 4/17/15

TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR

COVER SHEET

DRAWING
C-01
SCALE N.T.S.
SHEET 01 OF 10

PROJECT NARRATIVE

THIS PROJECT INCLUDES THE REPAIR OF SANITARY SEWER CROSSING IN TAYLOR RUN. THE DAMAGE CONSISTED PRIMARILY OF BROKEN CONCRETE HOST PIPE THAT EXPOSED THE CIP LINER THEREFORE, THE EXPOSED LINER IS UNPROTECTED IN THE TAYLOR RUN CHANNEL. THE SITE IS LOCATED APPROXIMATELY 100 FEET BEHIND CHINQUAPIN RECREATION CENTER NEAR CHINQUAPIN DR. AND KING ST.

EXISTING CONDITIONS SURVEY NOTES

- HORIZONTAL DATUM: H: NAD 1983
VERTICAL DATUM: V: NAVD 1988
- EXISTING UNDERGROUND UTILITIES ARE KNOWN TO EXIST IN AND AROUND THE PROPOSED WORK AREAS. EXISTING UNDERGROUND UTILITY INFORMATION IS TAKEN FROM AVAILABLE RECORDS. THE CONTRACTOR IS RESPONSIBLE TO CONTACT "MISS UTILITY" UTILITY SERVICE PROTECTION CENTER AT 1-800-552-7001 REGARDING THE LOCATION OF THESE UNDERGROUND UTILITIES, AND FOR VERIFYING THE EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES THAT MAY OCCUR DUE TO HIS FAILURE TO LOCATE AND PROTECT THESE UNDERGROUND FACILITIES.
- LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR/ENGINEER SHOULD DIG TEST PITS BY HAND AT ALL UTILITY CROSSINGS TO VERIFY EXACT LOCATION.

CITY STANDARD GENERAL NOTES

- TOTAL SITE AREA: 0.22 ACRES WILL BE DISTURBED WITH THIS PROJECT.
- THE SITE IS LOCATED IN THE TAYLOR RUN WATERSHED.
- CONSTRUCTION PERMITS ARE REQUIRED FOR THIS PROJECT.
- THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES TO EXISTING ROADS AND UTILITIES THAT OCCUR AS A RESULT OF HIS CONSTRUCTION PROJECT WITHIN OR CONTIGUOUS TO EXISTING CITY OR STATE RIGHTS-OF-WAY.
- ALL CONSTRUCTION ACTIVITIES SHALL COMPLY WITH THE ALEXANDRIA NOISE CONTROL CODE, TITLE 11, CHAPTER 5, WHICH PERMITS CONSTRUCTION ACTIVITY TO OCCUR BETWEEN THE FOLLOWING HOURS: MONDAY THROUGH FRIDAY 7AM TO 6PM AND SATURDAY FROM 9AM TO 6PM. NO CONSTRUCTION ACTIVITY IS PERMITTED ON SUNDAY. ANY DEVIATION FROM THESE WORK HOURS SHALL REQUIRE CITY APPROVAL.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER AND ENGINEER OF ANY CHANGES OR CONDITIONS ATTACHED TO PERMITS OBTAINED FROM ANY AUTHORITY ISSUING PERMITS.
- THE DESIGN, CONSTRUCTION, FIELD PRACTICES AND METHODS SHALL CONFORM TO THE REQUIREMENTS SET FORTH BY THE CITY OF ALEXANDRIA AND ITS CURRENT ZONING ORDINANCE AND CONSTRUCTION STANDARDS MANUAL. FAILURE TO COMPLY WITH THE CODE, APPLICABLE MANUALS, PROVISIONS OF THE CONSTRUCTION OR THE PERMITS SHALL BE DEEMED A VIOLATION.
- THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE CONTRACTOR OR HIS AGENT OF ANY LEGAL RESPONSIBILITIES WHICH MAY BE REQUIRED BY THE CODE OF VIRGINIA OR ANY ORDINANCE ENACTED BY THE CITY OF ALEXANDRIA.
- THERE ARE MAPPED RESOURCE PROTECTION AREAS (RPA) ON THIS PROPERTY.
- ALL CONSTRUCTION ACTIVITIES SHALL CONFORM WITH LATEST EDITION OF OSHA REGULATIONS AND GUIDELINES.
- KNOWN PUBLIC AND PRIVATE EASEMENTS ARE SHOWN.
- ALL NEW CONSTRUCTION WILL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ALEXANDRIA AND/OR THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) STANDARDS AND SPECIFICATIONS.
- ALL IMPROVEMENTS TO THE CITY RIGHT-OF-WAY SUCH AS CURB, GUTTER, SIDEWALK, AND DRIVEWAY APRONS, ETC., CONSTRUCTED AS PER THE CITY OF ALEXANDRIA STANDARDS AND SPECIFICATIONS.
- ALL STREET CUT AND PATCH WORK LOCATED IN PUBLIC RIGHT-OF-WAYS, REQUIRED FOR ANY UTILITY INSTALLATION SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CITY OF ALEXANDRIA STANDARDS AND SPECIFICATIONS AND TO THE SATISFACTION OF THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL SERVICES (T&ES).
- ALL EROSION AND SEDIMENTATION CONTROL SHALL BE PLACED AND MAINTAINED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF ALEXANDRIA AND/OR VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH).
- ANY WORK IN THE PUBLIC RIGHT OF WAY SHALL REQUIRE A SEPARATE PERMIT FROM THE DIRECTOR, TRANSPORTATION AND ENVIRONMENTAL SERVICES.
- ELECTRIC POWER WILL BE COORDINATED WITH DOMINION VIRGINIA POWER.
- THERE IS NO OBSERVABLE EVIDENCE OF CEMETERIES OR BURIAL GROUNDS ON THIS PROPERTY.
- GAS SERVICE WILL BE COORDINATED WITH WASHINGTON GAS.
- AS NOTED, THE PURPOSE OF THE PROJECT IS TO REHABILITATE A SANITARY SEWER CROSSING. AS SUCH, THE PROJECT IS EXEMPT FROM THE STATE WATER QUALITY REQUIREMENT PER SEC. 13-123(A)(2) OF ARTICLE XIII OF THE ZONING ORDINANCE (ENVIRONMENTAL MANAGEMENT ORDINANCE).
- PER SEC.13-123(A)(2)(C), THE PROJECT MUST BE IN COMPLIANCE WITH ALL APPLICABLE STATE AND FEDERAL REQUIREMENTS AND PERMITS, AND DESIGNED AND CONDUCTED IN A MANNER THAT PROTECTS WATER QUALITY.

NOTES FOR PRESERVATION AND PROTECTION OF EXISTING VEGETATION

- VEGETATION TO BE REMOVED SHALL BE APPROVED BY THE CITY ARBORIST.
- PROVIDE, IMPLEMENT AND FOLLOW A TREE CONSERVATION AND PROTECTION PROGRAM THAT IS DEVELOPED TO THE SATISFACTION OF THE CITY ARBORIST.
- PROTECTION PROGRAM SHALL BE AUTHORED BY AN ARBORIST CERTIFIED BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE.
- LOCATION AND METHOD FOR PROTECTION AND PRESERVATION OF EXISTING TREES ON ALL PLAN SHEETS INCLUDING DEMOLITION, SEDIMENT AND EROSION CONTROL, SITE PLAN AND LANDSCAPE PLAN.
- PROVIDE PROTECTION OF EXISTING VEGETATION IN COMPLIANCE WITH LANDSCAPE GUIDELINES OF THE CITY OF ALEXANDRIA.
- LOCATION AND METHOD FOR PROTECTION AND PRESERVATION OF EXISTING TREES SHALL BE APPROVED IN-FIELD BY THE CITY ARBORIST PRIOR TO COMMENCEMENT OF GROUND DISTURBING ACTIVITY.
- CONTRACTOR MUST PROVIDE DOCUMENTATION OF COMMUNICATION WITH THE ADJACENT PROPERTY OWNER(S) VERIFYING NOTIFICATION OF CONSTRUCTION IMPACT, POTENTIAL FOR LOSS, AND AGREED UPON REMEDIAL MEASURES PERTAINING TO THE EXISTING TREE(S) ON ADJACENT PROPERTIES THAT WILL BE EFFECTED BY PROJECT WORK.
- PROVIDE SPECIFIC CONSTRUCTION STAGING INFORMATION THAT INDICATES THE METHODS, AND PROCEDURES TO BE IMPLEMENTED FOR PROTECTION OF EXISTING ON-SITE AND OFF-SITE VEGETATION.
- TREE PROTECTION SHALL BE PROVIDED WHERE SILT FENCE IS NOT ADEQUATE. PROTECTION SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE DRIP LINE OF THE TREES TO BE SAVED. THE CONTRACTOR SHALL CONSULT THE SITE INSPECTOR BEFORE THE CONSTRUCTION STARTS. TREE PROTECTION FENCING MUST BE ESTABLISHED AND APPROVED BY THE CITY ARBORIST BEFORE ANY CLEARING OR CONSTRUCTION CAN BE STARTED. TO THE EXTENT POSSIBLE ALL TREE PROTECTION SHALL BE INSTALLED AT THE DRIP LINE OF THE TREE (S).

NOTES FOR PROPOSED PLANTINGS

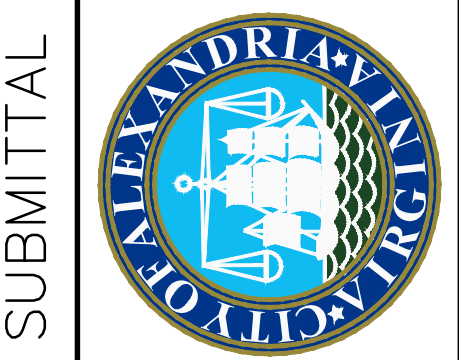
- PLANTINGS SHALL BE PROVIDED IN COMPLIANCE WITH LANDSCAPE GUIDELINES OF THE CITY OF ALEXANDRIA.
- PROVIDE SPECIFICATIONS FOR PLANTINGS IN ACCORDANCE WITH THE CURRENT AND MOST UP TO DATE EDITION OF ANSI-Z60.1, THE AMERICAN STANDARD FOR NURSERY STOCK AS PRODUCED BY THE AMERICAN ASSOCIATION OF NURSERYMEN; WASHINGTON, DC.

CONSTRUCTION NOTES

- THE CONTRACTOR SHALL VISIT THE SITE AND SHALL VERIFY EXISTING CONDITIONS PRIOR TO STARTING CONSTRUCTION.
- THE CONTRACTOR SHALL REMOVE AND DISPOSE OFF-SITE ANY STREAM DEBRIS THAT IS LOCATED WITHIN THE DISTURBED WORK AREA. STREAM DEBRIS SHALL NOT BE LEFT ON SITE IF IT IS DISTURBED DURING CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CAUSING ANY EXISTING UTILITIES TO BE DISCONNECTED.
- ALL AREAS, ON OR OFF-SITE, WHICH ARE DISTURBED BY THIS CONSTRUCTION AND WHICH ARE NOT PAVED OR BUILT UPON, SHALL BE ADEQUATELY STABILIZED TO CONTROL EROSION AND SEDIMENTATION. THE MINIMUM ACCEPTABLE STABILIZATION SHALL CONSIST OF PERMANENT GRASS, SEED MIXTURE TO BE AS APPROVED BY THE CITY OF ALEXANDRIA AGENT. ALL SLOPES 3:1 AND GREATER SHALL BE SODDED AND PEGGED OF OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY OF ALEXANDRIA.
- ALL OVERHEAD POLE LINES SHALL BE RELOCATED AS REQUIRED BY THE OWNING UTILITY COMPANIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS AND COORDINATING ALL WORK REQUIRED FOR THE NECESSARY RELOCATIONS.
- EXISTING PHYSICAL FEATURES ARE TO BE REMOVED AS REQUIRED BY THE CONTRACT DOCUMENTS.
- EXISTING CONSTRUCTION SHALL BE REMOVED TO NEAREST JOINT. NEW CONSTRUCTION SHALL BE PROVIDED AS SHOWN AND ANY DAMAGED AREA SHALL BE REPAIRED TO MATCH CONDITIONS EXISTING PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS TO THE ADJACENT CURB, GUTTER, AND RIGHT-OF-WAY, IF DAMAGED DURING CONSTRUCTION ACTIVITY AS DETERMINED BY THE DIRECTOR, DEPARTMENT OF PROJECT IMPLEMENTATION.
- TOPS OF EXISTING STRUCTURES WHICH REMAIN IN USE ARE TO BE ADJUSTED IN ACCORDANCE WITH THE GRADING PLAN. ALL PROPOSED STRUCTURE TOP ELEVATIONS ARE TO BE VERIFIED BY THE CONTRACTOR WITH THE SITE GRADING PLANS. IN CASE OF CONFLICT, THE GRADING PLAN SHALL SUPERSEDE PROFILE ELEVATIONS. MINOR ADJUSTMENTS TO MEET FINISHED GRADE ELEVATIONS MAY BE REQUIRED.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE SURE THAT ANY EXISTING LANDSCAPING WHICH IS TO BE RELOCATED ON THE SITE WILL BE CAREFULLY STORED IN A DESIGNATED AREA BEFORE BEING REPLANTED. COORDINATION WITH THE OWNER FOR MUTUALLY AGREEABLE STORAGE LOCATIONS FOR LANDSCAPE MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF PLANT MATERIAL THAT DOES NOT SURVIVE STORAGE AND REPLANTING.
- CONSTRUCTION STAKEOUT SHALL BE UNDER THE DIRECT SUPERVISION OF A LICENSED LAND SURVEYOR IN THE COMMONWEALTH OF VIRGINIA.
- ALL EROSION CONTROLS SHALL CONFORM TO THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCHB) AND MUST BE SUBMITTED AND APPROVED BY T&ES.
- ALL EARTHWORK OPERATIONS ARE TO BE PERFORMED UNDER THE FULL TIME, ON-SITE SUPERVISION OF A REGISTERED GEOTECHNICAL ENGINEER WITH GEOTECHNICAL TESTING IN ACCORDANCE WITH CONSTRUCTION SPECIFICATIONS AND GEOTECHNICAL REPORT REQUIREMENTS.
- THE CONTRACTOR MUST ENSURE THAT POSITIVE DRAINAGE OCCURS ON SITE TO PREVENT PONDING OR DRAINAGE PROBLEMS ON ADJACENT PROPERTIES.
- CONTRACTOR MUST ENSURE THAT THERE IS NO DISTURBANCE ON ADJACENT PROPERTIES.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN UTILITY SERVICES AT ALL TIMES DURING CONNECTION AND/OR CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL TRAFFIC CONTROL DURING CONSTRUCTION. NO SIDE AND/OR CROSS WALK SHALL BE CLOSED DURING CONSTRUCTION. IF SIDE AND/OR CROSS WALK NEED TO BE CLOSED TO FACILITATE THE CONSTRUCTION THEN THE CONTRACTOR SHALL PROVIDE A SIDE AND/OR CROSS WALK CLOSURE PLAN TO THE SATISFACTION OF THE DIRECTOR OF TRANSPORTATION AND ENVIRONMENTAL SERVICES (T&ES).
- THE CONTRACTOR IS ADVISED THAT DURING RAIN EVENTS FLOW IN THE STREAM CAN INCREASE DRAMATICALLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL WORK COMPLETED AND/OR PARTIALLY COMPLETED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY AND PROTECTION OF ALL EQUIPMENT EMPLOYED IN THE EXECUTION OF THE WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TRAIL ACCESS AT ALL TIMES.
- THE CONTRACTOR SHALL MAINTAIN FULL VEHICULAR ACCESS ON THE GARDEN ACCESS ROAD AT ALL TIMES.

ARCHAEOLOGY NOTES

- CALL ALEXANDRIA ARCHAEOLOGY DEPARTMENT (703-838-4399) IMMEDIATELY IF ANY STONE OR POTTERY, INDIAN ARTIFACTS OR HISTORICAL STRUCTURAL REMAINS, WALL FOUNDATIONS, PRIVIES, CISTERNS, ICE WELLS, ETC OR CONCENTRATION OF ARTIFACTS ARE FOUND DURING CONSTRUCTION WORK. WORK MUST CEASE IN THE AREA OF THE DISCOVERY UNTIL A CITY ARCHAEOLOGIST COMES TO THE SITE TO RECORD THE FINDS.
- THE APPLICANT MUST NOT ALLOW METAL DETECTION TO BE CONDUCTED ON THE PROPERTY UNLESS AUTHORIZED BY ALEXANDRIA ARCHAEOLOGY.



CITY OF ALEXANDRIA, VIRGINIA
DEPARTMENT OF PROJECT IMPLEMENTATION
301 KING STREET
ALEXANDRIA, VIRGINIA 22313

REVISIONS	DATE	DESCRIPTION

ALEXANDRIA PROJECT NO.:	11-105
DATE OF PLAN ISSUANCE:	
CONSULTANT PROJECT ID.:	
DESIGNED BY:	CUB DATE: 4/17/15
DRAWN BY:	CUB DATE: 4/17/15
CHECKED BY:	AG DATE: 4/17/15
APPROVED BY:	MB DATE: 4/17/15

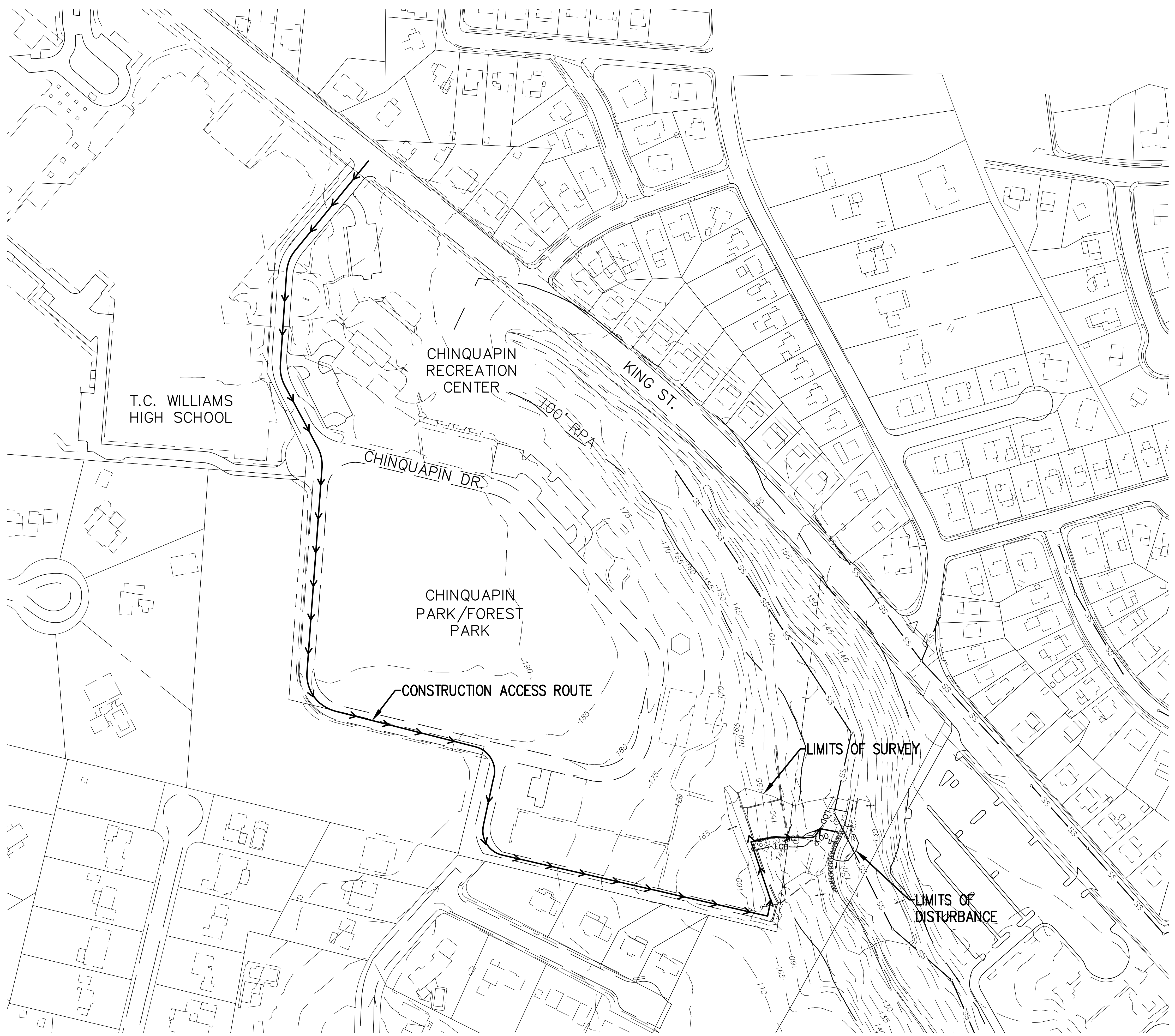
GENERAL NOTES

DRAWING
C-02
SCALE N.T.S.
SHEET 02 OF 10

TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR 100% SUBMITTAL

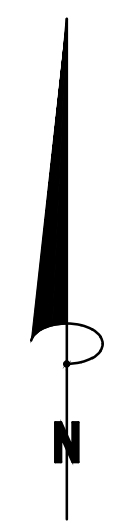
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GENERAL NOTES:

- 1) CONTRACTOR TO PROPOSE AN APPROPRIATE CONSTRUCTION ENTRANCE AND LAYDOWN AREA APPROVED BY THE CITY OF ALEXANDRIA.
- 2) CONTRACTOR TO RESTORE ALL DISTURBED AREA TO EXISTING OR BETTER CONDITION.



TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR

100% SUBMITTAL

SITE ACCESS PLAN

DRAWING
C-03
SCALE 1" = 100'
SHEET 03 OF 10

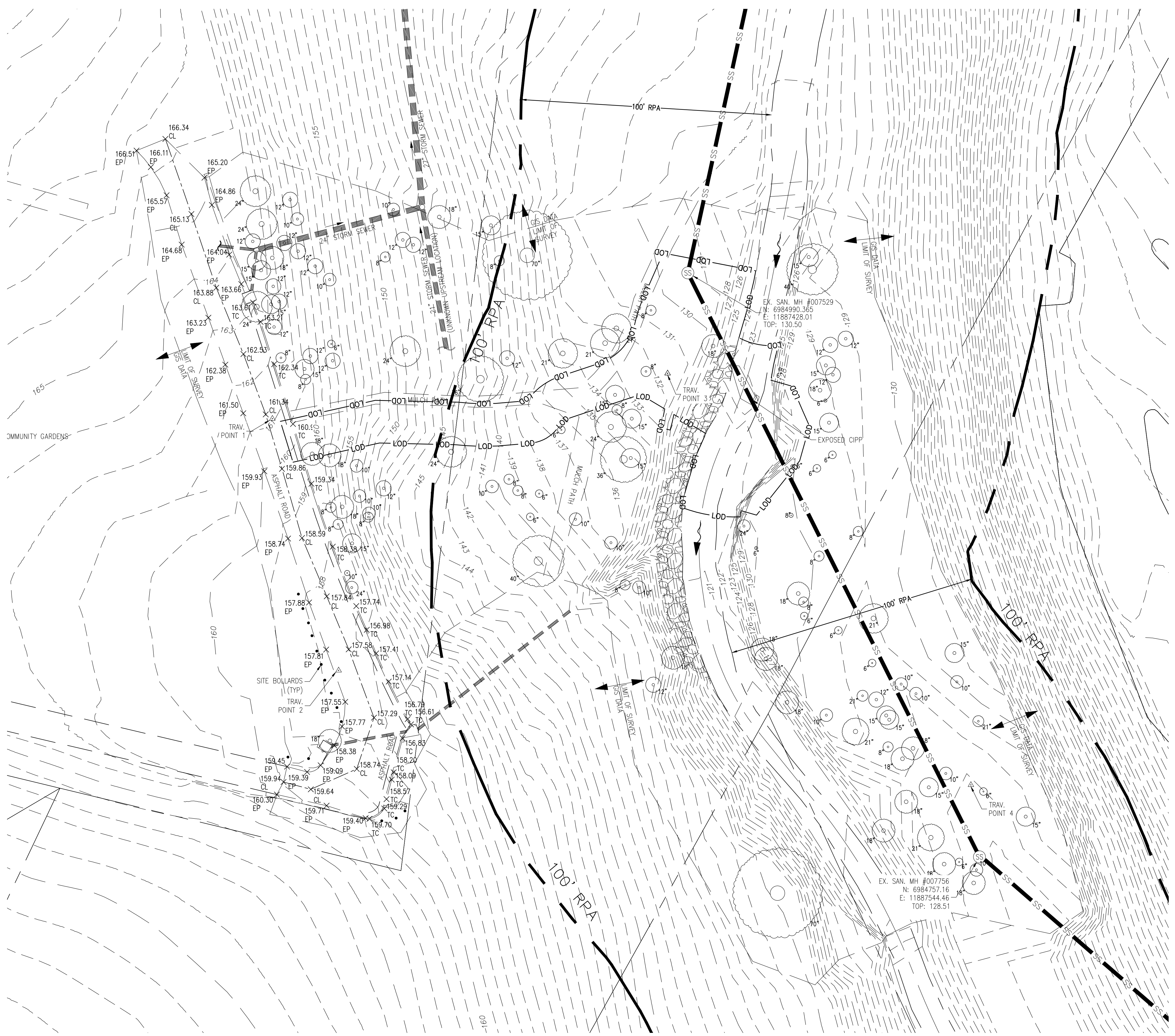
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CITY OF ALEXANDRIA, VIRGINIA
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301 KING STREET
ALEXANDRIA, VIRGINIA 22313



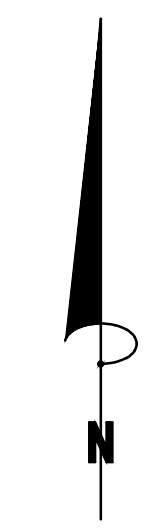
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 USER: Christopher.Rodriguez
 VERSION: 2.0
 4/17/2015



GENERAL NOTES:

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- 2) CONTRACTOR TO RESTORE ALL DISTURBED AREA TO EXISTING OR BETTER CONDITION.

SURVEY TRAVERSE POINTS			
TRAVERSE POINT	NORTHING	EASTING	ELEVATION
1	6984932.15	11887262.11	161.11
2	6984831.62	11887288.56	157.67
3	6984950.25	11887419.92	132.03
4	6984785.87	11887541.03	126.52



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TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR
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CITY OF ALEXANDRIA, VIRGINIA
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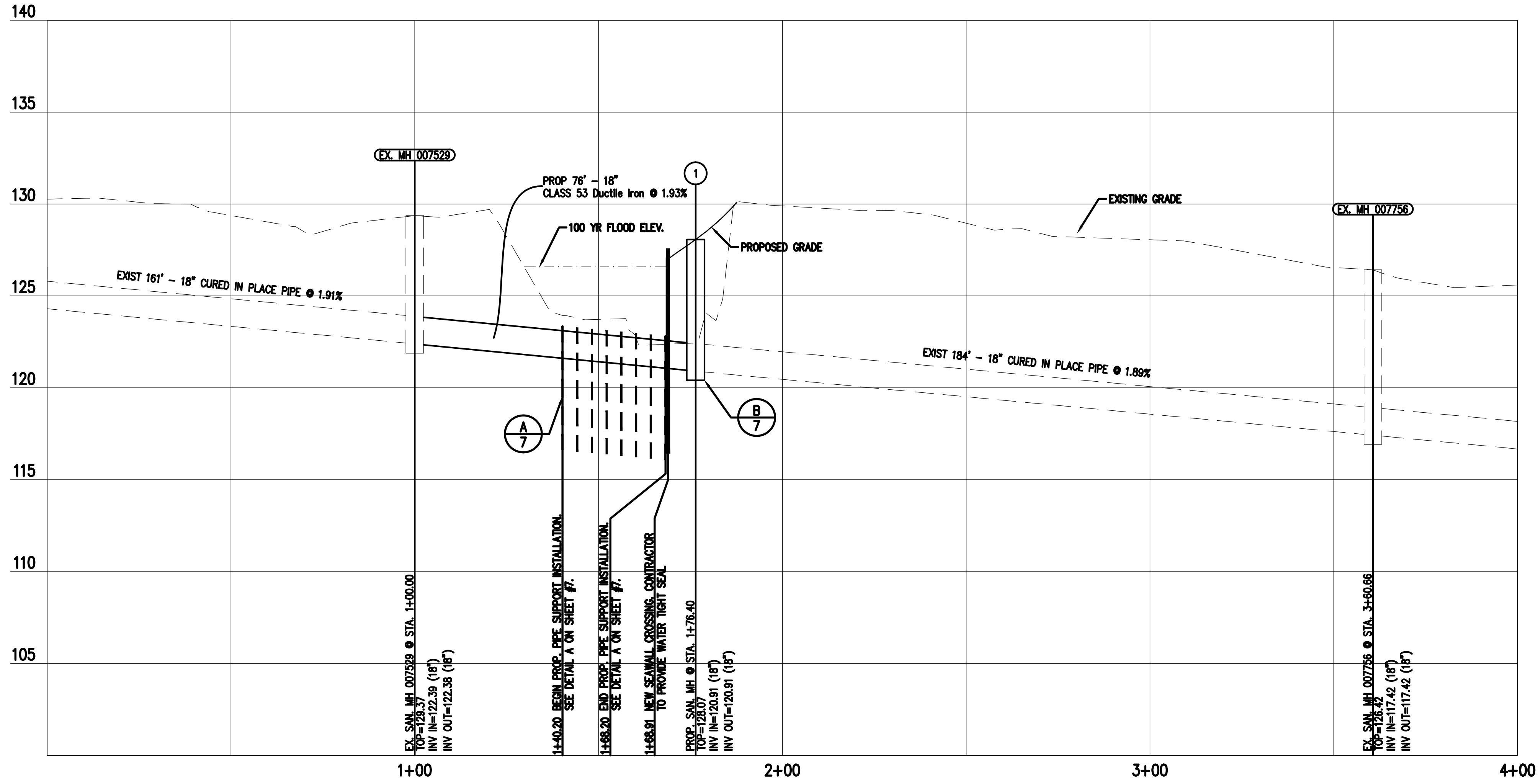
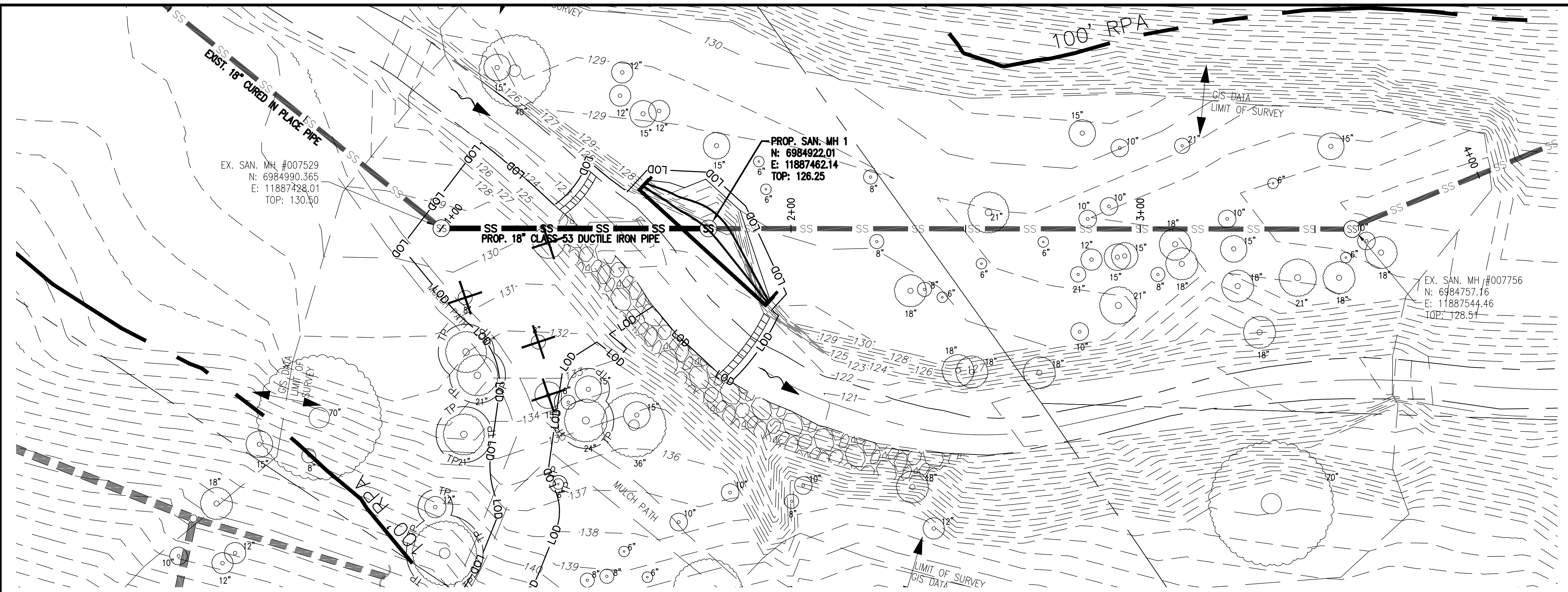
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EXISTING CONDITIONS PLAN

DRAWING
 C-04
 SCALE 1" = 20'
 SHEET 04 OF 10

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SANITARY SEWER ALIGNMENT PROFILE

SCALE: HORIZ. 1"=20', VERT. 1"=4'

SANITARY SEWER STRUCTURE TABLE			
STRUCTURE NAME:	NORTHING	EASTING	INVERT INFORMATION
1	6984922.01	11887462.14	TOP=128.07 IN=120.91 OUT=120.91
EX. SAN MH #007529	6984990.36	11887428.01	TOP=129.37 IN=122.39 OUT=122.38
EX. SAN MH #007530	6985147.98	11887462.38	TOP=128.02 IN=125.47 OUT=125.47
EX. SAN MH #007756	6984757.16	11887544.46	TOP=126.42 IN=117.42 OUT=117.42

GENERAL NOTES:

- CONTRACTOR TO REPLACE EXISTING 18" CURED IN PLACE PIPE WITH NEW DUCTILE IRON PIPE AND MAINTAIN INVERT AND SLOPE.
- CONTRACTOR TO ENSURE A WATER TIGHT SEAL BETWEEN SEAWALL AND NEW DUCTILE IRON PIPE AND SLOPE.
- EACH PIPE SUPPORT SYSTEM SHOULD BE INSTALLED AT LEAST 4' APART. THE CONTRACTOR TO INSTALL 8 PIPE SUPPORT SYSTEMS ALONG THE EXPOSED PIPE IN THE STREAM.



TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR 100% SUBMITTAL



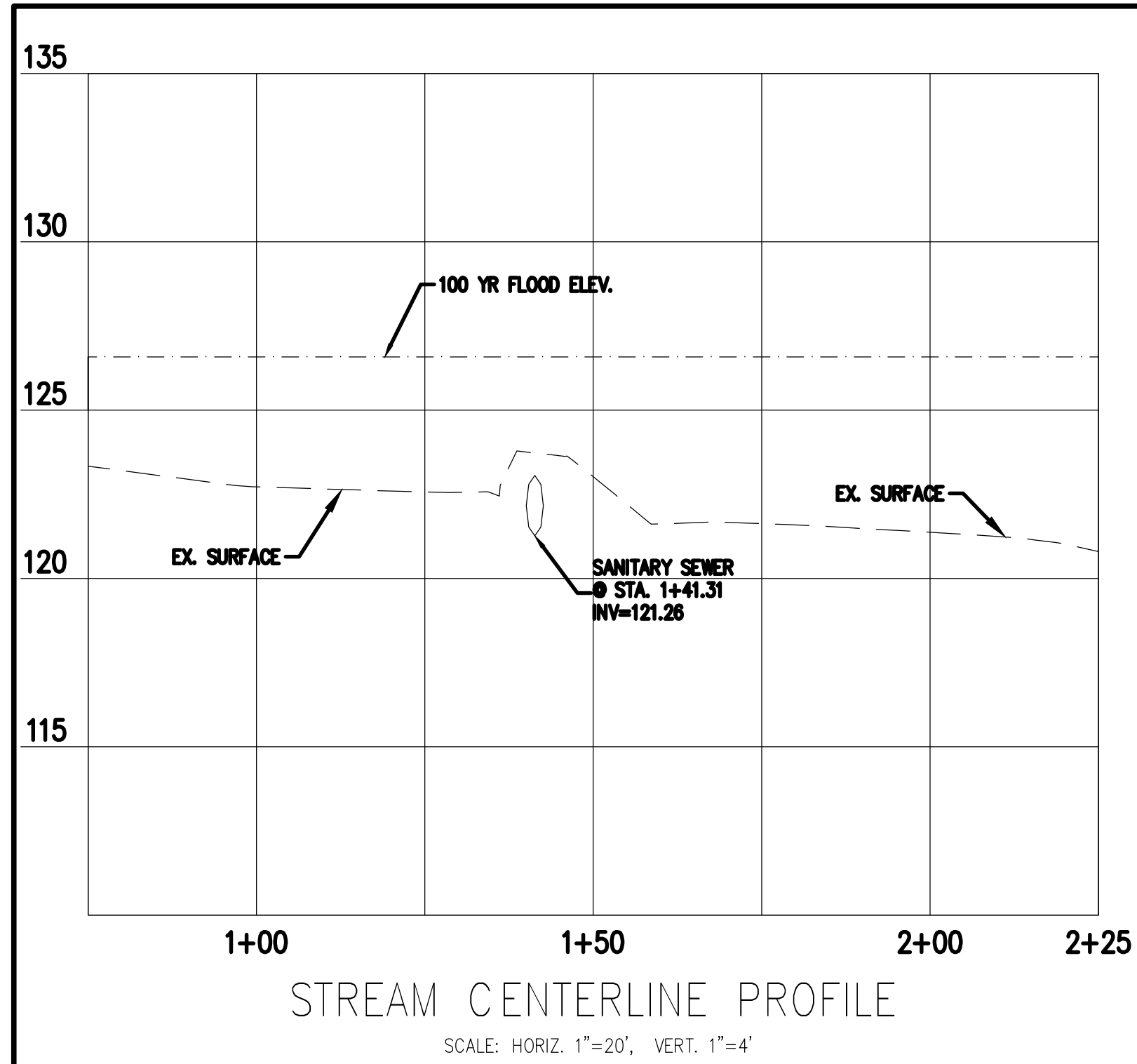
CITY OF ALEXANDRIA, VIRGINIA
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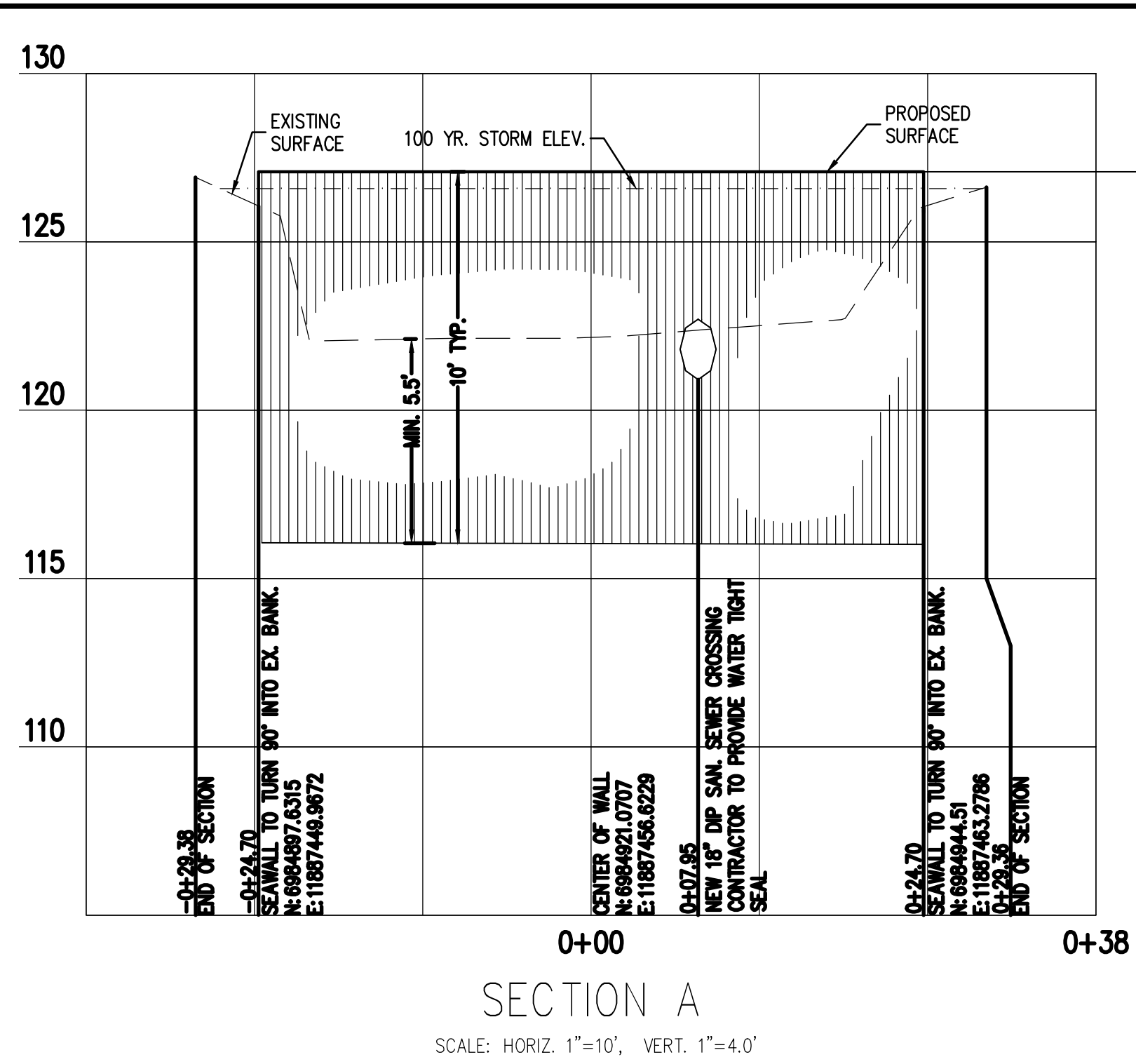
SANITARY SEWER PLAN AND PROFILE

DRAWING
 C-05
 SCALE 1" = 20'
 SHEET 05 OF 10



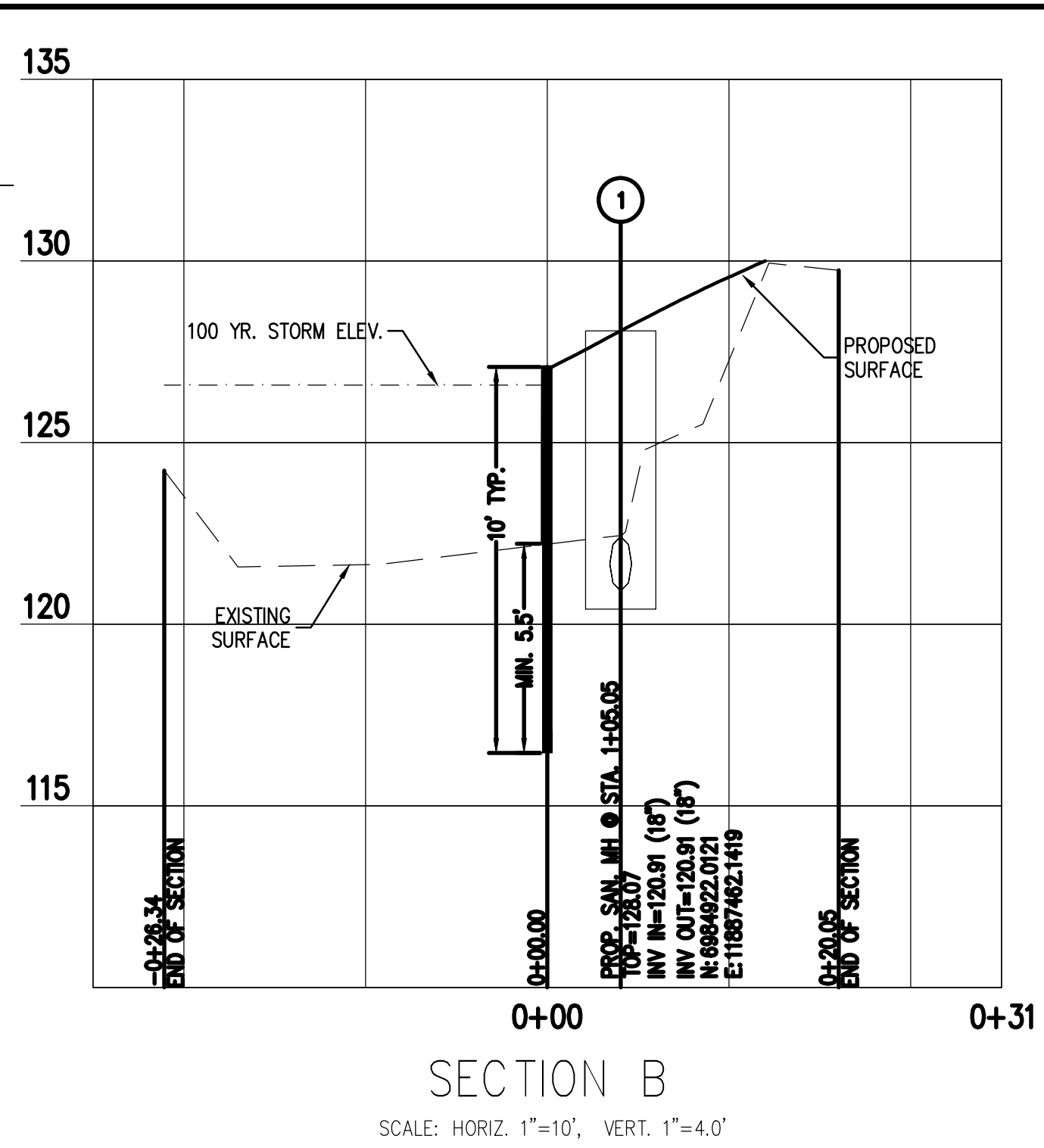
STREAM CENTERLINE PROFILE

SCALE: HORIZ. 1"=20', VERT. 1"=4'



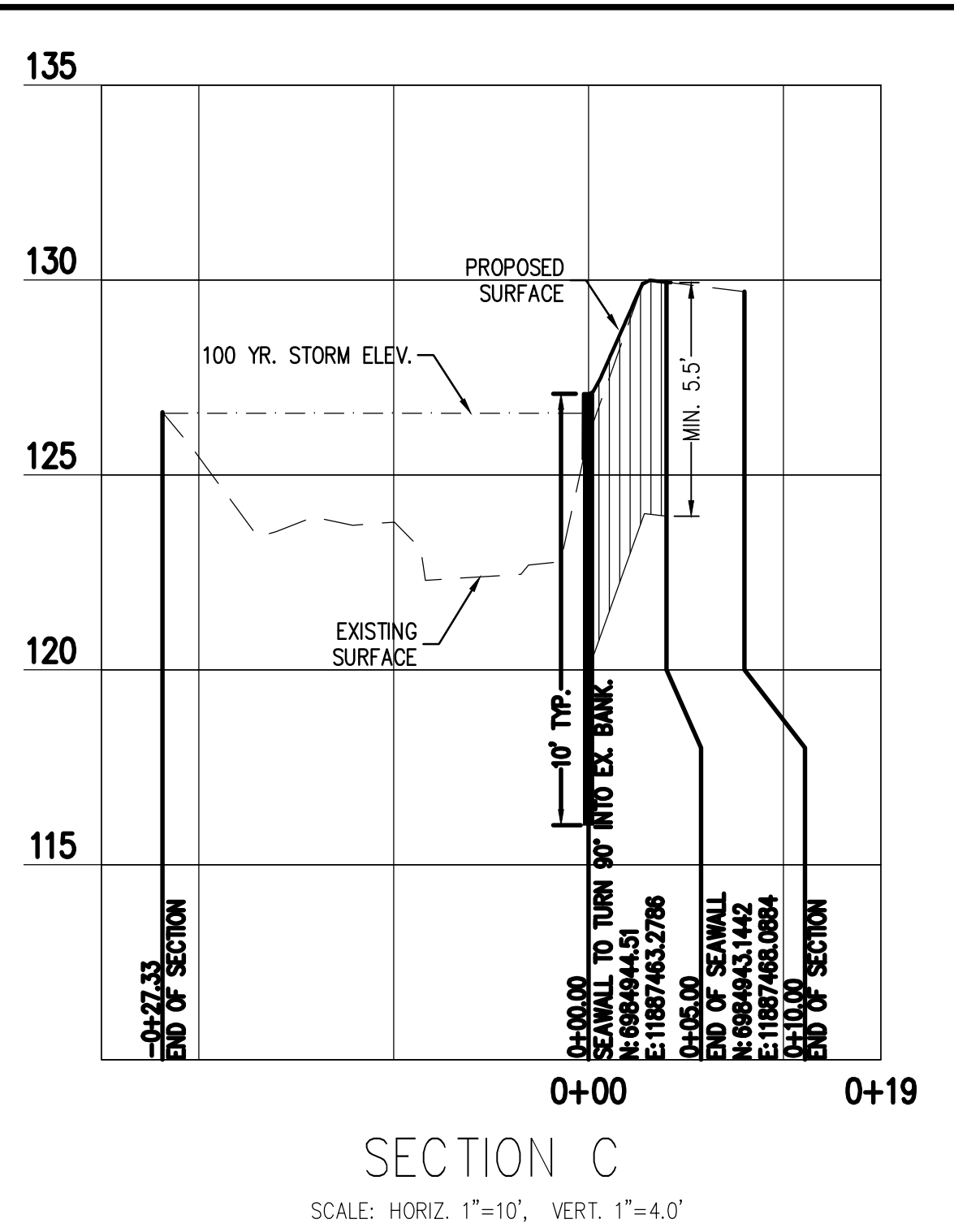
SECTION A

SCALE: HORIZ. 1"=10', VERT. 1"=4.0'



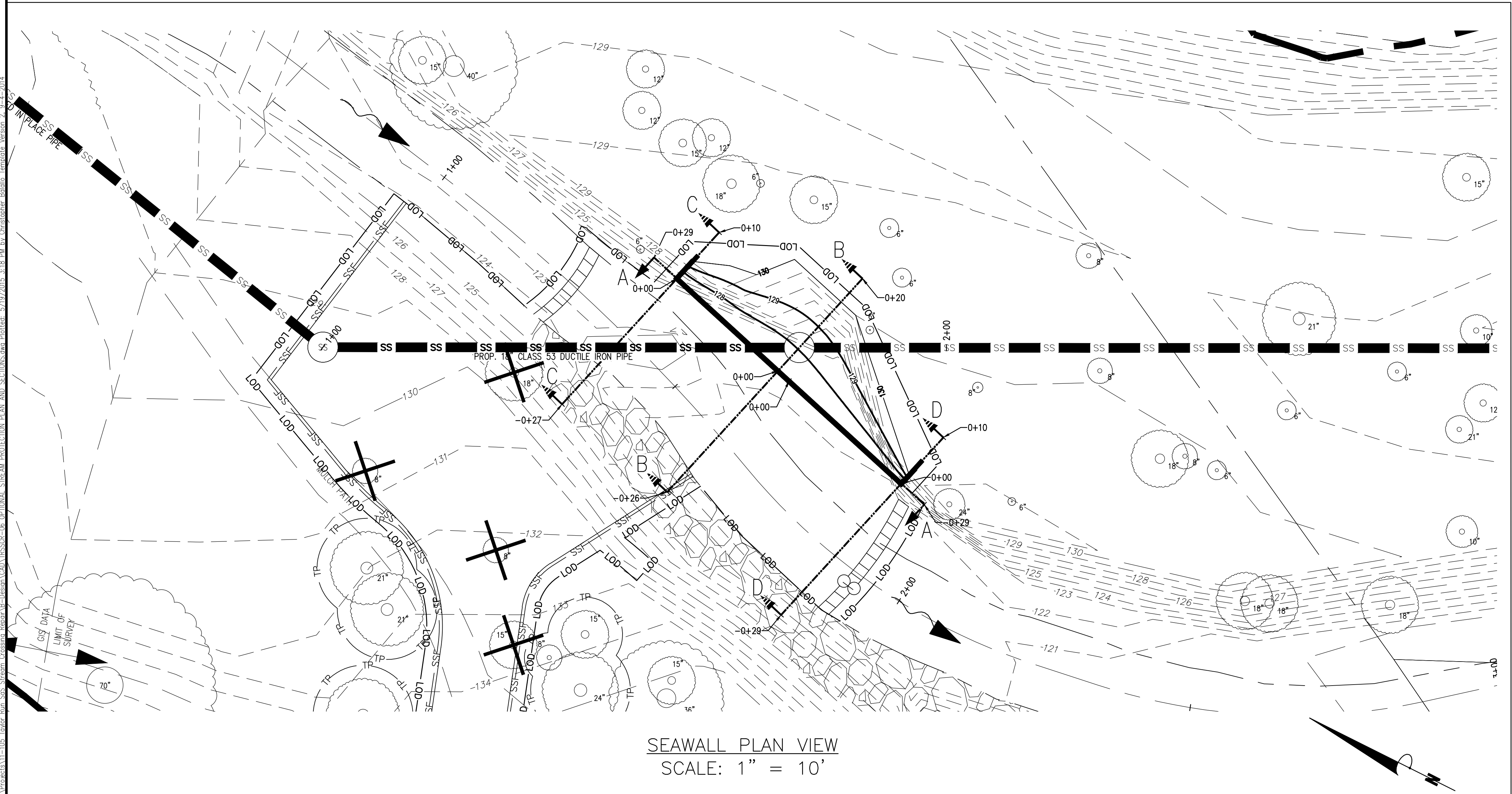
SECTION B

SCALE: HORIZ. 1"=10', VERT. 1"=4.0'



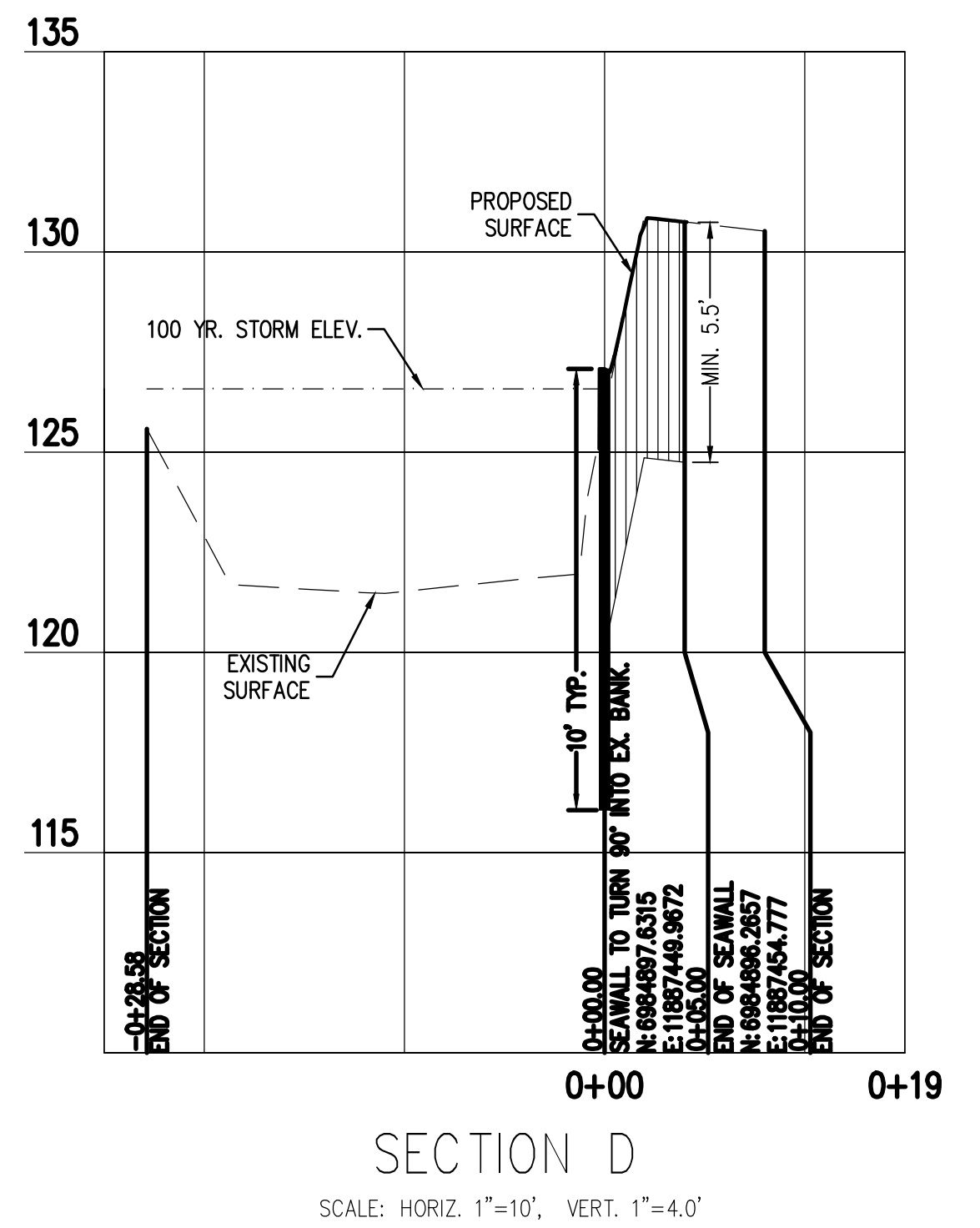
SECTION C

SCALE: HORIZ. 1"=10', VERT. 1"=4.0'



SEAWALL PLAN VIEW

SCALE: 1" = 10'



SECTION D

SCALE: HORIZ. 1"=10', VERT. 1"=4.0'

GENERAL NOTES:

- 1) CONTRACTOR TO USE WHOLE SEAWALL SECTIONS.
- 2) SEAWALL DESIGN BASED ON EVERLAST VINYL SEAWALL.
- 3) CONTRACTOR TO SEQUENCE CONSTRUCTION TO PROVIDE A WATER TIGHT SEAL BETWEEN THE PIPE PENETRATION AND THE SEAWALL.



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DRAWN BY: CUB DATE: 4/17/15

CHECKED BY: AG DATE: 4/17/15

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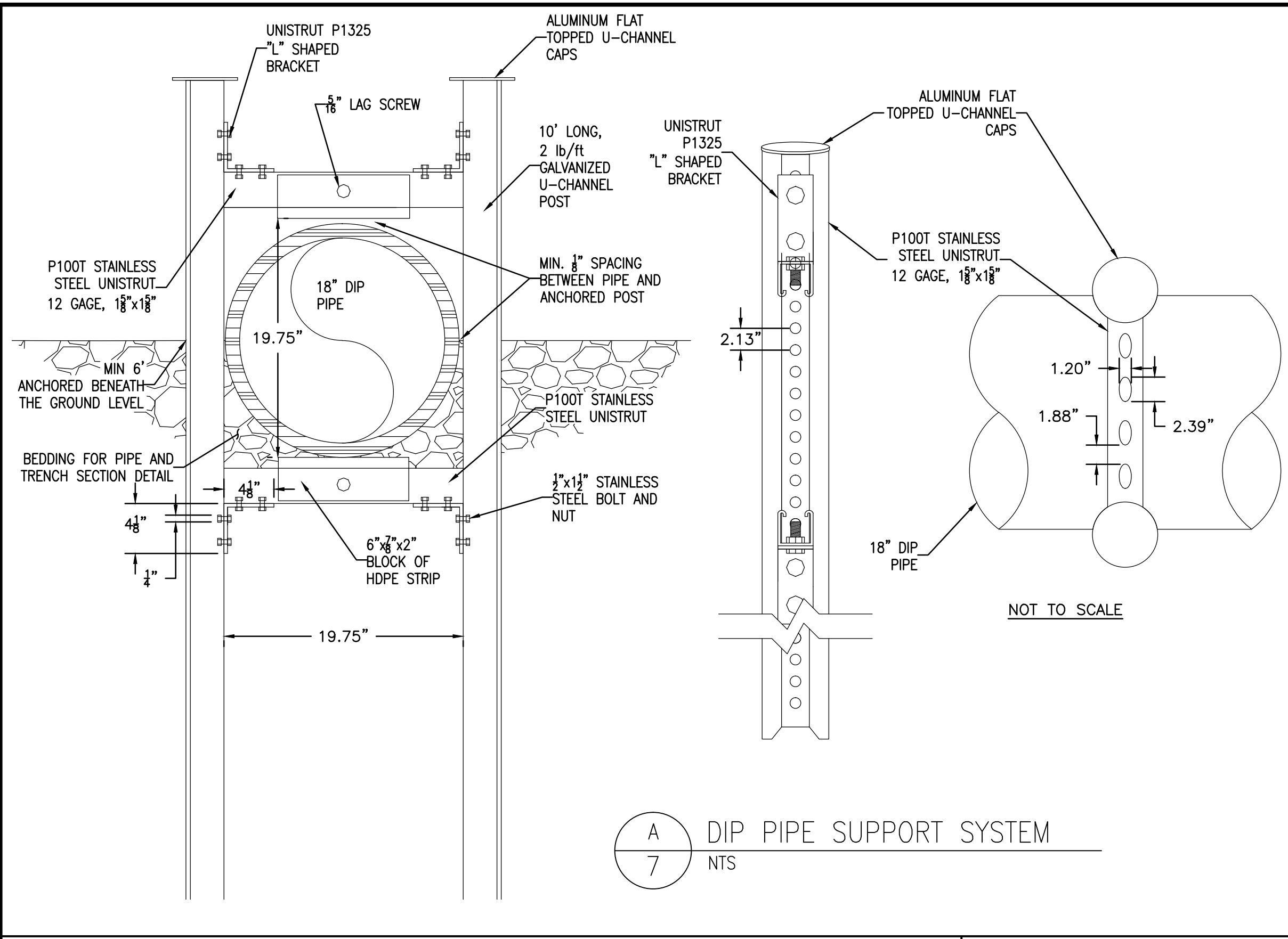
SEAWALL PLAN AND SECTIONS

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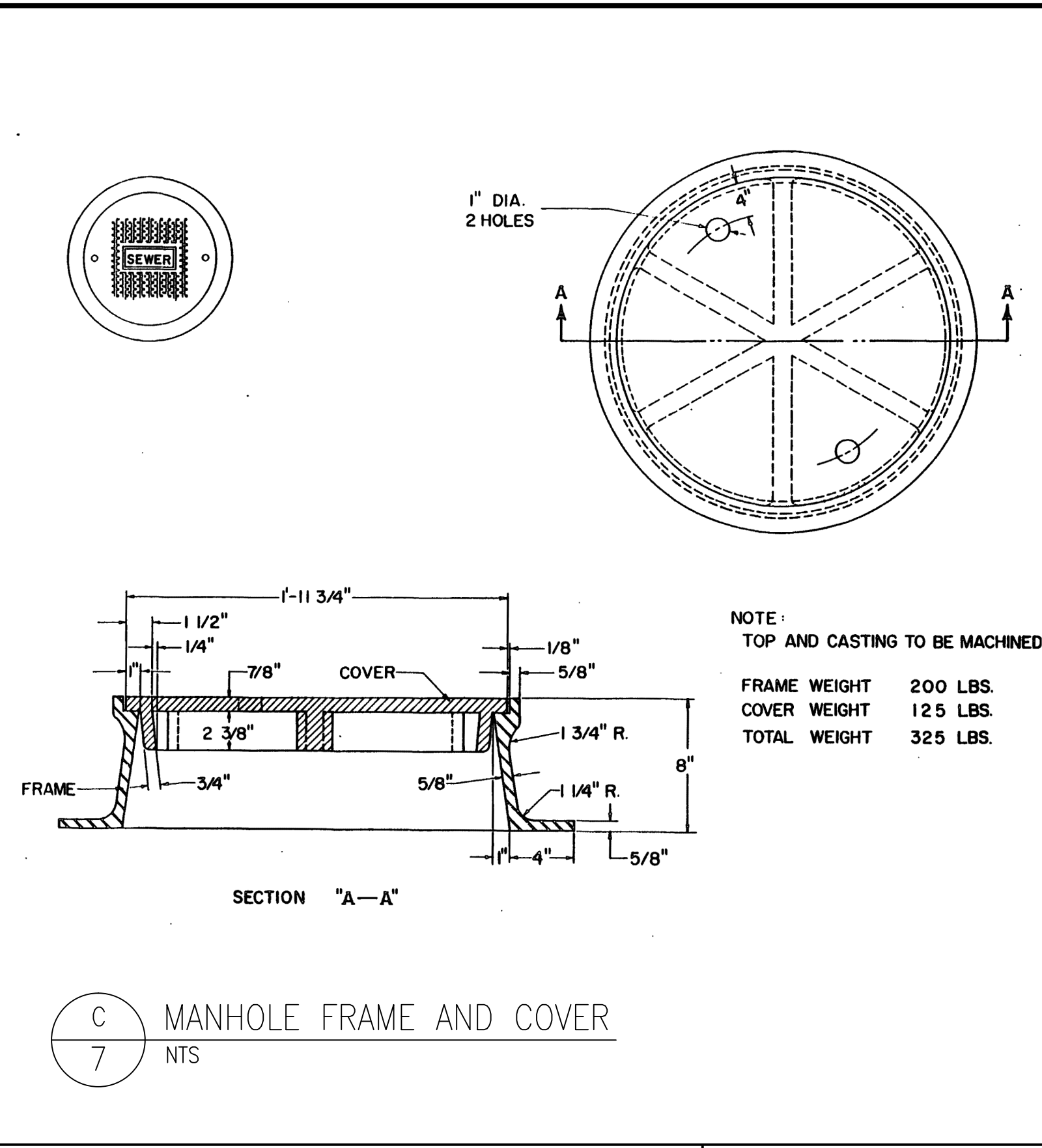
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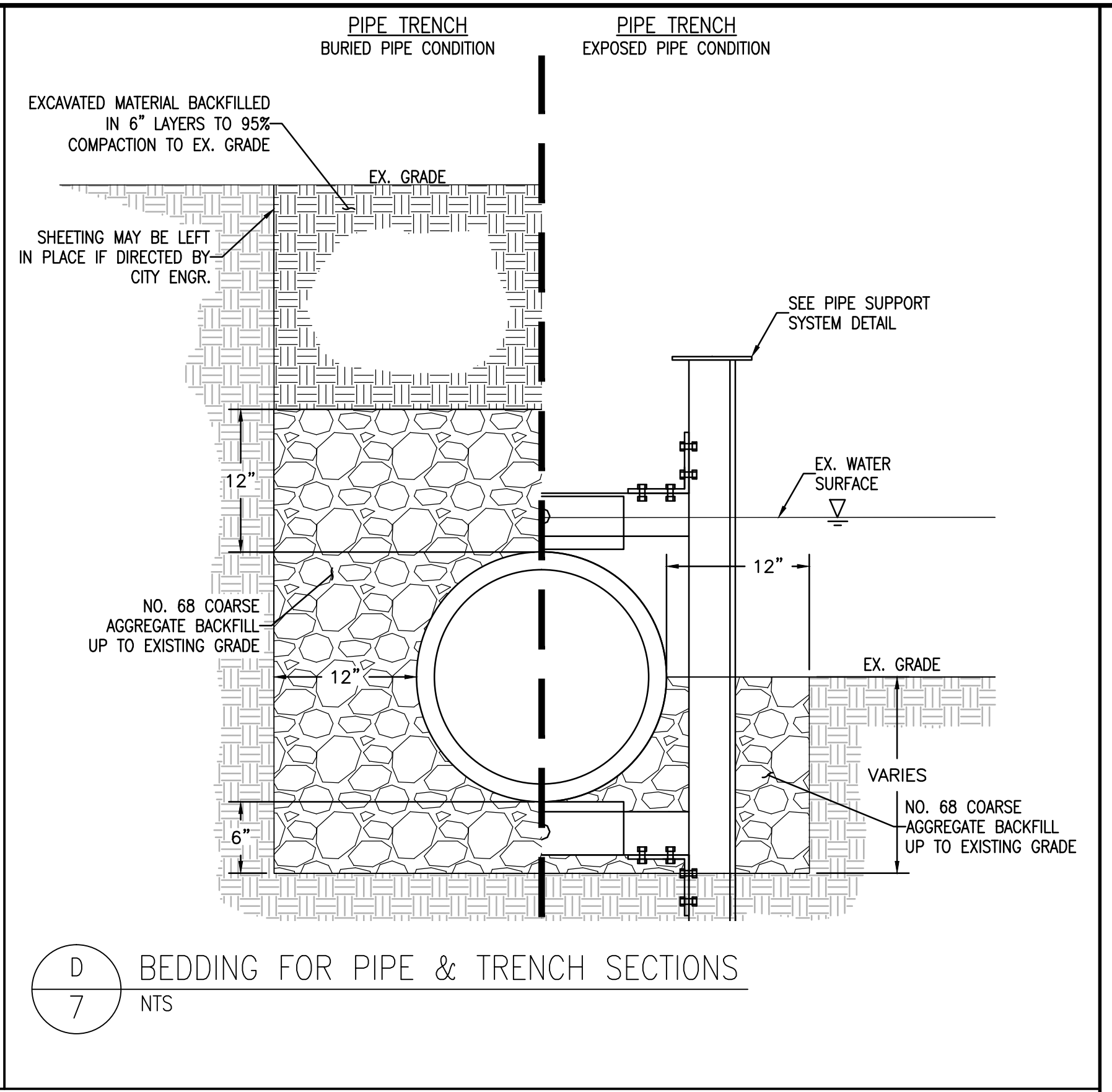
TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR



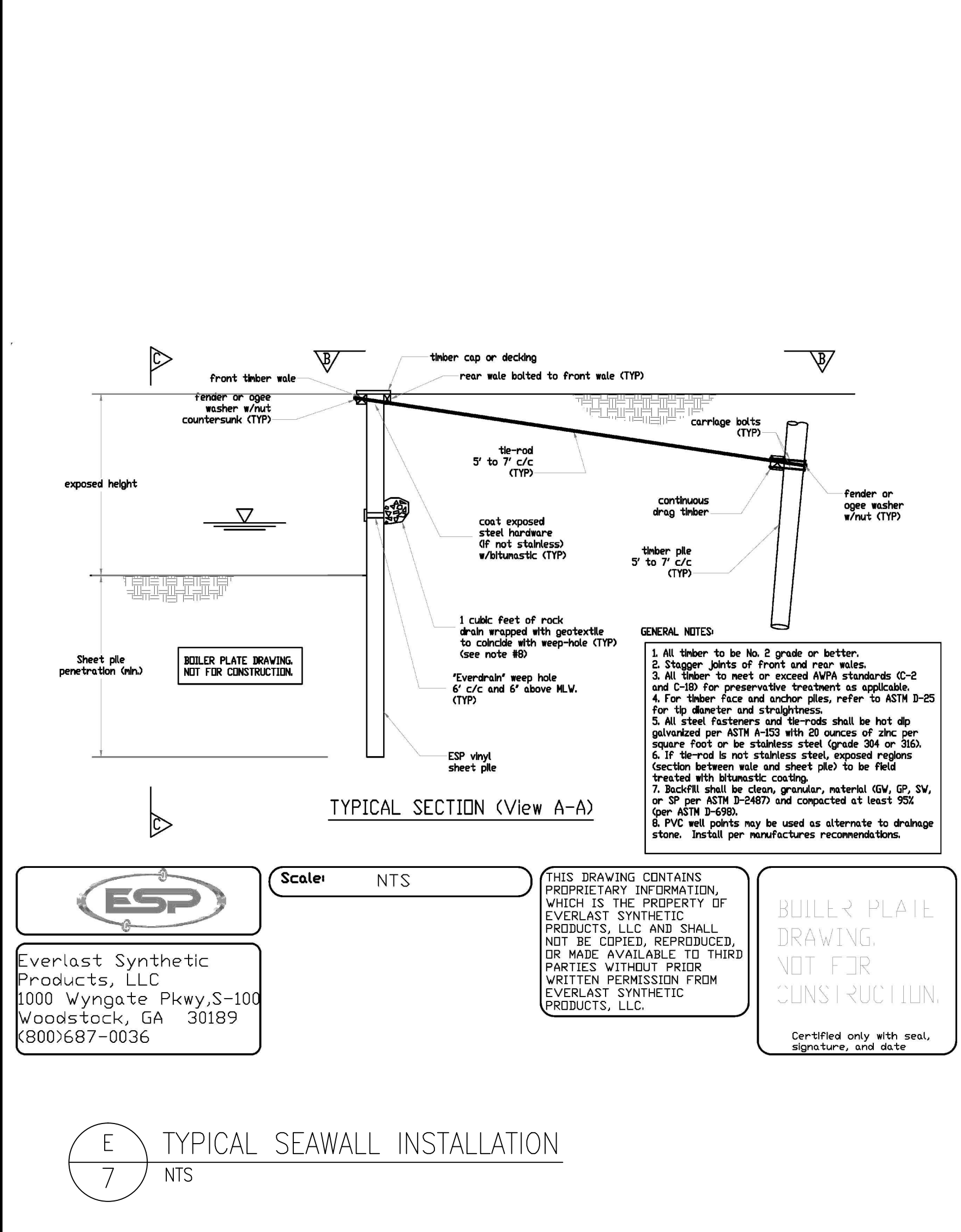
A
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DIP PIPE SUPPORT SYSTEM
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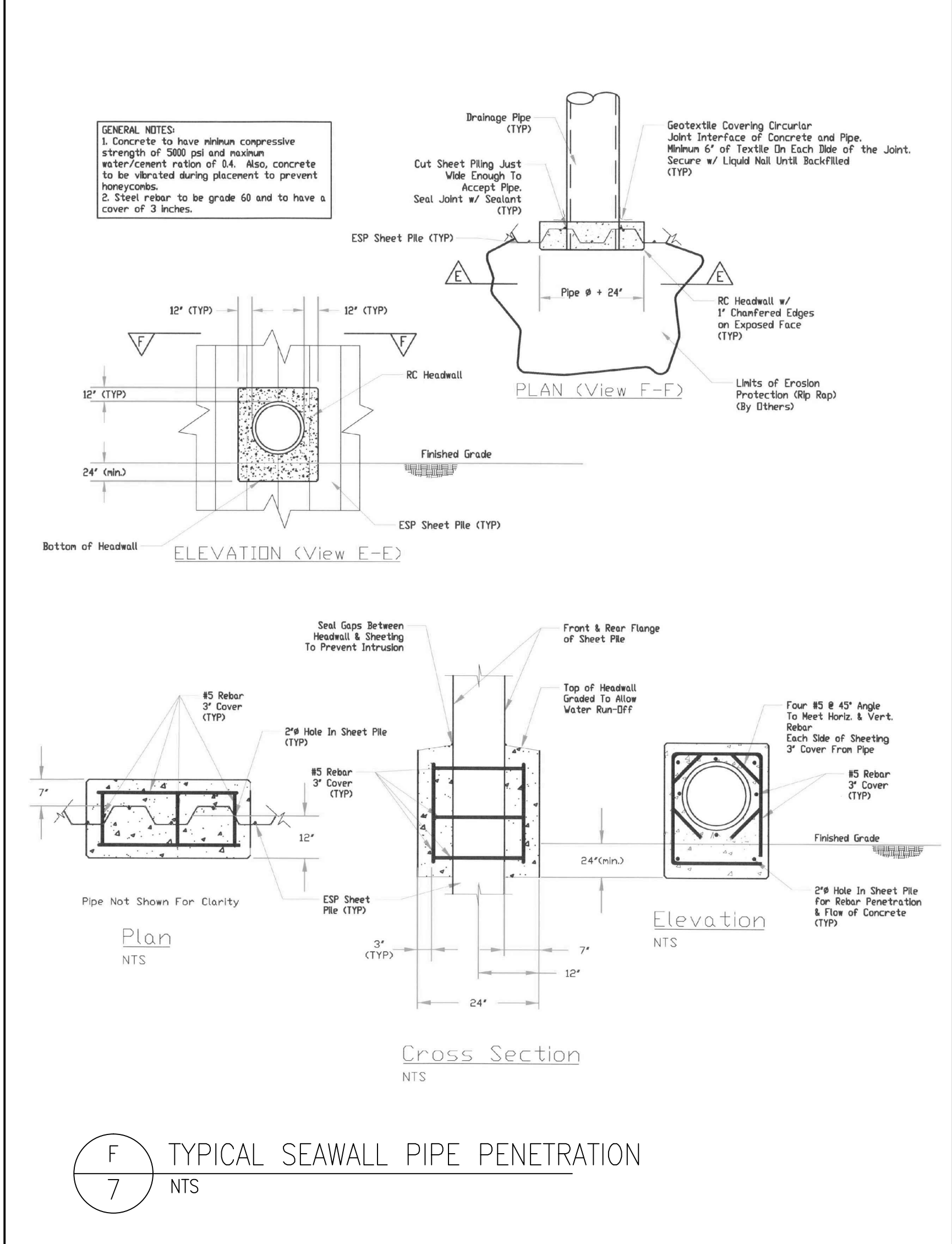
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MANHOLE FRAME AND COVER
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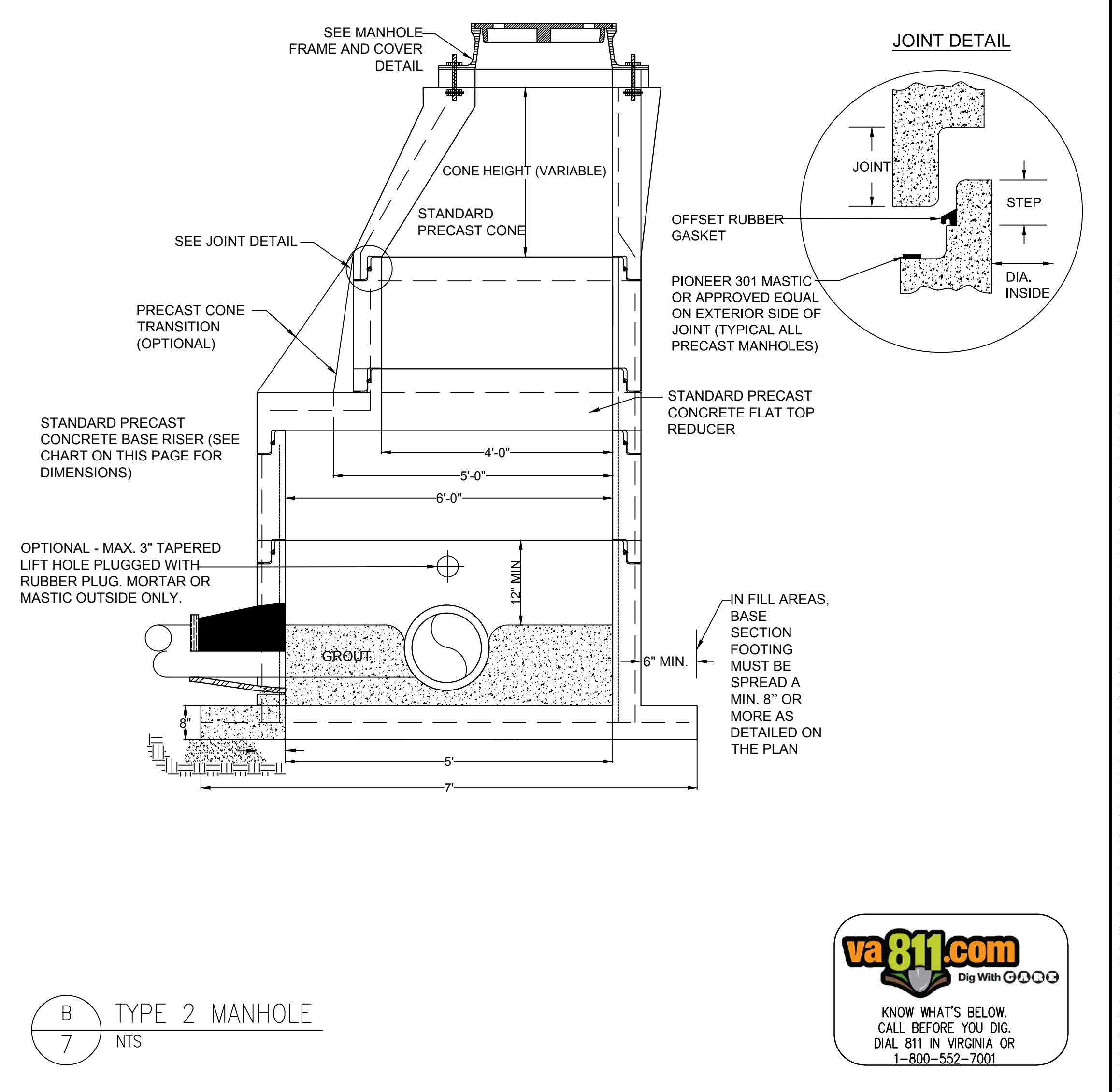
D
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BEDDING FOR PIPE & TRENCH SECTIONS
NTS




E
7
TYPICAL SEAWALL INSTALLATION
NTS



F
7
TYPICAL SEAWALL PIPE PENETRATION
NTS



B
7
TYPE 2 MANHOLE
NTS



CITY OF ALEXANDRIA, VIRGINIA
DEPARTMENT OF PROJECT IMPLEMENTATION
301 KING STREET
ALEXANDRIA, VIRGINIA 22313


100% SUBMITTAL

REVISIONS	BY	DATE	DESCRIPTION

ALEXANDRIA PROJECT NO.: 11-105
DATE OF PLAN ISSUANCE:
CONSULTANT PROJECT ID:
DESIGNED BY: CUB DATE: 4/17/15
DRAWN BY: CUB DATE: 4/17/15
CHECKED BY: AG DATE: 4/17/15
APPROVED BY: MB DATE: 4/17/15

CIVIL DETAILS

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SHEET 07 OF 10



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GENERAL NOTES

E-1 EROSION AND SEDIMENTATION CONTROL PLAN INFORMATION:
a. PROJECT DESCRIPTION - REPAIR OF SANITARY SEWER CROSSING
b. THIS PROJECT IS LOCATED IN THE CITY OF ALEXANDRIA AND APPROXIMATELY 1 ACRES WILL BE DISTURBED BY THE PROPOSED CONSTRUCTION ACTIVITY.
c. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE A CERTIFIED LAND DISTURBER FOR THE PROJECT.

E-2 THE TEMPORARY EROSION AND SILTATION CONTROL ITEMS SHOWN ON THE EROSION AND SEDIMENT CONTROL (ESC) PLAN FOR THIS PROJECT ARE INTENDED TO PROVIDE A GENERAL PLAN FOR CONTROLLING EROSION AND SEDIMENT WITHIN THE PROJECT LIMITS. THE ESC PLAN IS BASED ON FIELD CONDITIONS AT THE TIME OF PLAN DEVELOPMENT AND AN ASSUMED SEQUENCE OF CONSTRUCTION FOR THE PROJECT. THE CONTRACTOR, IN CONJUNCTION WITH THE ENGINEER AND ENVIRONMENTAL MONITOR, SHALL ADJUST THE LOCATION, QUANTITY AND TYPE OF EROSION AND SEDIMENT CONTROL ITEMS REQUIRED BASED ON THE ACTUAL FIELD CONDITIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION AND THE ACTUAL SCHEDULING AND SEQUENCING OF THE CONSTRUCTION ACTIVITIES. SIGNIFICANT CHANGES TO THE PROPOSED ESC PLAN (E.G., THOSE THAT REQUIRE AN EMERGENCY ANALYSIS) SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. ANY CHANGES TO THE PROPOSED ESC PLAN MUST BE NOTED ON A DESIGNATED PLAN SET (RECORD SET) WHICH SHALL BE RETAINED ON THE PROJECT SITE AND MADE AVAILABLE UPON REQUEST.

E-3 THE AREAS BEYOND THE PROJECT'S CONSTRUCTION AREA ARE TO BE PROTECTED FROM SILTATION. PERIMETER CONTROLS SUCH AS FILTER BARRIER, SILT FENCE, DIVERSION DIKES, TURBIDITY CURTAINS, ETC. SHALL BE INSTALLED PRIOR TO ANY GRUBBING OPERATIONS OR OTHER EARTH MOVING ACTIVITIES.

EROSION/SEDIMENT CONTROL NOTES

- A. THE CONTRACTORS ARE TO KEEP DENUDED AREAS TO A MINIMUM. ALL EROSION / SEDIMENTATION CONTROL MEASURES WILL CONFORM TO THE CURRENT STANDARDS OF THE CITY OF ALEXANDRIA AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
B. UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS §4VAC50-30 EROSION AND SEDIMENT CONTROL REGULATIONS.
C. T&ES MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENTS OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION. CERTIFIED RESPONSIBLE LAND DISTURBER IS REQUIRED TO ATTEND PRE-CONSTRUCTION MEETING.
D. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING. AN INSPECTION BY THE CITY OF ALEXANDRIA IS REQUIRED AFTER INITIAL INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND BEFORE ANY CLEARING OR GRADING CAN BEGIN.
E. TO THE EXTENT POSSIBLE, ALL TREE PROTECTION SHALL BE INSTALLED AT THE DRIP LINE OF THE TREE(S).
F. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
G. PRIOR TO COMMENCING ANY LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN THOSE INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE CITY OF ALEXANDRIA.
H. ALL DISTURBED AREAS OF THE SITE THAT ARE NOT TO BE WORKED FOR SEVEN OR MORE CALENDAR DAYS MUST BE STABILIZED.
I. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
J. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED THROUGH AN APPROVED FILTERING DEVICE.
K. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES DAILY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
L. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL NOT BE WORKED FOR SEVEN OR MORE CALENDAR DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN FOUR MONTHS.
M. AT THE COMPLETION OF THE PROJECT AND PRIOR TO THE RELEASE OF THE BOND ALL DISTURBED AREAS SHALL BE STABILIZED AND ALL TEMPORARY EROSION AND SEDIMENT CONTROL SHALL BE REMOVED.

POLLUTION PREVENTION PLAN:

THE CONTRACTOR WILL ENSURE THE POLLUTION PREVENTION MEASURES ARE DESIGNED, INSTALLED, IMPLEMENTED AND MAINTAINED TO:

- A. PROHIBIT THE DISCHARGE OF WASTEWATER AND WASH WATER, WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS, AND OTHER CONSTRUCTION MATERIALS
B. PROHIBIT DISCHARGE OF FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE
C. PROHIBIT DISCHARGE OF SOAPS OR SOLVENT USED IN VEHICLE AND EQUIPMENT WASHING
D. PROHIBIT UNLESS MANAGED BY APPROPRIATE CONTROLS THE DISCHARGES FROM DEWATERING ACTIVITIES, INCLUDING DEWATERING OF TRENCHES OR EXCAVATIONS;
E. MINIMIZE EXPOSURE OF CONSTRUCTION AND LANDSCAPE MATERIALS AND WASTES, TRASH, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE, AND OTHER MATERIALS ONSITE TO PRECIPITATION AND TO STORMWATER
F. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM SPILLS AND LEAKS AND IMPLEMENT CHEMICAL SPILL AND LEAK PREVENTION AND RESPONSE PROCEDURES.

PUMP AROUND PRACTICE

1. DESIGN REQUIREMENTS AND PROCEDURES

- A. PUMP SELECTION REQUIRES THE COMPUTATION OF TOTAL DYNAMIC HEAD (TDH): TDH = STATIC SUCTION LIFT + STATIC DISCHARGE HEAD + FRICTION LOSS + VELOCITY HEAD (GODWIN 2003).
B. HEIGHT OF IN-STREAM BARRIERS SHALL BE THE NORMAL BASE FLOW DEPTH + 1 FOOT OF FREEBOARD FOR PUMP-AROUND DIVERSIONS THAT WILL BE INSTALLED AND REMOVED IN THE SAME WORKDAY.
C. HEIGHT OF IN-STREAM BARRIERS FOR A CONTINUOUS PUMP-AROUND SHALL BE THE 2-YEAR STORM ELEVATION + 1 FOOT OF FREEBOARD. THE MINIMUM IN-STREAM BARRIER HEIGHT IS 2 FEET.
D. ALWAYS REQUIRES A PUMP WITH A CAPACITY GREATER THAN THAT REQUIRED TO PUMP THE DESIRED FLOW.
E. CONTRACTOR TO PROVIDE A SUBMITTAL PRIOR TO INSTALLATION OF THE PUMP AROUND PRACTICE.
F. THE PUMP AROUND PRACTICE SHALL BE DESIGNED AND OPERATED IN ACCORDANCE WITH THE REQUIREMENTS OF ALL CODES AND REGULATORY AGENCIES HAVING JURISDICTION IN THE VICINITY OF THE PROJECT SITE.

2. MATERIAL SPECIFICATIONS

- A. IN-STREAM BARRIER: EITHER RIPRAP PER SPECIFICATION 3.19: RIPRAP OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK OR SANDBAGS. SANDBAGS MAY BE FILLED ON SITE OR PRE-FILLED AND MADE OF BURLAP OR POLYPROPYLENE MATERIALS WHICH ARE RESISTANT TO ULTRAVIOLET RADIATION, TEARING, AND PUNCTURE AND SHOULD BE WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF THE FILL MATERIAL (I.E., SAND, FINE GRAVEL, ETC.).
B. SHEETING: SEAMLESS POLYETHYLENE PLASTIC SHEETING WITH A MINIMUM 4-MIL THICKNESS IMPERVIOUS AND RESISTANT TO PUNCTURE, TEARING AND ULTRAVIOLET DEGRADATION OR EQUIVALENT.
C. PUMPING EQUIPMENT: ELECTRIC, DIESEL OR GASOLINE VENTURI, VACUUM, OR CENTRIFUGAL PRIMED PUMP. APPROPRIATELY SIZED RIGID INTAKE AND DISCHARGE PIPE/HOSE WITH POSITIVE RESTRAINED JOINTS. NECESSARY CONNECTORS AND PROPERLY STORED FUEL.
D. DEWATERING STRUCTURE: PER STANDARD AND SPECIFICATION 3.26 IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK OR SEDIMENT/DIRT BAG PER MANUFACTURERS SPECIFICATIONS.
E. VELOCITY DISSIPATER: RIPRAP OR SANDBAG LINED PLUNGE POOL SIZED TO BE NON-EROSIVE AT THE DISCHARGE PIPE VELOCITY.

3. CONSTRUCTION RECOMMENDATIONS

- A. SANDY MATERIAL MAY BE USED TO FILL SANDBAGS. IF PERMITTED, MATERIAL FROM THE CHANNEL MAY BE USED TO FILL THE BAGS.
B. THE LENGTH OF STREAM DEWATERED SHOULD BE DETERMINED BY THE AMOUNT OF WORK THAT CAN BE COMPLETED IN ONE WORKDAY. CONTINUOUS PUMPING ADDS INCREASED COSTS AND RISKS OF FAILURE AND DELAYS.
C. WHERE POSSIBLE, UTILIZE EXISTING POOLS WITHIN THE STREAM IN PLACE OF AN EXCAVATED SUMP-HOLE.
D. STRATEGIC PLACEMENT OF THE IN-STREAM BARRIER CAN ELIMINATE MULTIPLE INSTALLATIONS DURING CONSTRUCTION.
E. REMOVE ALL LARGE DEBRIS LOCATED WITHIN THE FOUNDATION OF THE BARRIER TO ENSURE PROPER SEALING AND REDUCE LEAKAGE THROUGH THE BARRIER.
F. SANDBAG/STONE BARRIER SHOULD BE MONITORED DAILY FOR LEAKAGE AND REPAIRED AS NECESSARY.

4. INSTALLATION GUIDELINES

- A. EXCAVATE SUMP HOLE OR IDENTIFY EXISTING POOL UPSTREAM OF THE WORK AREA.
B. INSTALL VELOCITY DISSIPATER DOWNSTREAM OF THE WORK AREA.
C. SET UP PUMP AND HOSE/PIPE.
D. INSTALL UPSTREAM AND DOWNSTREAM BARRIERS AND START PUMP.
E. USE DE-WATERING PUMP AND DEWATERING DEVICE TO REMOVE WATER LEFT BETWEEN THE IN-STREAM BARRIERS AFTER PRIMARY PUMP INSTALLATION AND AS NEEDED DURING CONSTRUCTION.
F. COMPLETE IN-STREAM CONSTRUCTION ACTIVITIES AND REMOVE IN-STREAM BARRIERS.
G. RESTORE/REPAIR IMPACTED STREAM AREAS.

NOTES:

- A. THE TEMPORARY EROSION AND SILTATION CONTROL ITEMS SHOWN ON THE PLAN SHEET ARE INTENDED TO PROVIDE A GENERAL PLAN FOR CONTROLLING EROSION AND SILTATION WITHIN THE PROJECT LIMITS.
B. THE AREA BEYOND THE PROJECT'S CONSTRUCTION AREA ARE TO BE PROTECTED FROM SILTATION, PERIMETER CONTROLS SUCH AS FILTER BARRIER, SILT FENCE ETC. SHALL BE INSTALLED PRIOR TO ANY DEBRIS REMOVAL OR OTHER EARTH MOVING ACTIVITIES.

CONSTRUCTION ENTRANCE NOTES:

- A. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONES AS CONDITIONS DEMAND OR AS DIRECTED BY THE ENGINEER AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT/DEBRIS SPILLED, DROPPED, WASHED INTO THE PUBLIC RIGHT OF WAY SHALL BE REMOVED IMMEDIATELY.
B. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

PORTABLE SEDIMENT TANK:

- A. STRUCTURE MAY BE CONSTRUCTED WITH STEEL DRUMS, STURDY WOOD OR OTHER MATERIAL SUITABLE FOR HANDLING THE PRESSURE EXERTED BY THE VOLUME OF WATER.
B. SEDIMENT TANKS WILL HAVE A MINIMUM DEPTH OF TWO FEET.
C. THE SEDIMENT TANK SHALL BE LOCATED FOR EASY CLEAN-OUT AND DISPOSAL OF THE TRAPPED SEDIMENT AND TO MINIMIZE THE INTERFERENCE WITH CONSTRUCTION ACTIVITIES.
D. THE FOLLOWING FORMULA SHALL BE USED TO DETERMINE THE STORAGE VOLUME OF THE SEDIMENT TANK:
E. PUMP DISCHARGE (G.P.M.) X 16 = CUBIC FEET OF STORAGE REQUIRED.
F. ONCE THE WATER LEVEL NEARS THE TOP OF THE TANK, THE PUMP MUST BE SHUT OFF WHILE THE TANK DRAINS AND ADDITIONAL CAPACITY IS MADE AVAILABLE.
G. THE TANK SHALL BE DESIGNED TO ALLOW FOR EMERGENCY FLOW OVER TOP OF THE TANK.
H. CLEAN-OUT OF THE TANK IS REQUIRED ONCE ONE-THIRD OF THE ORIGINAL CAPACITY IS DEPLETED DUE TO SEDIMENT ACCUMULATION. THE TANK SHALL BE CLEARLY MARKED SHOWING THE CLEAN-OUT POINT. CLEAN-OUT OF SEDIMENT TANK SHALL NOT BE IN THE STREAM.



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TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR

Table with 2 columns: REVISIONS, DESCRIPTION. Includes fields for DATE and BY.

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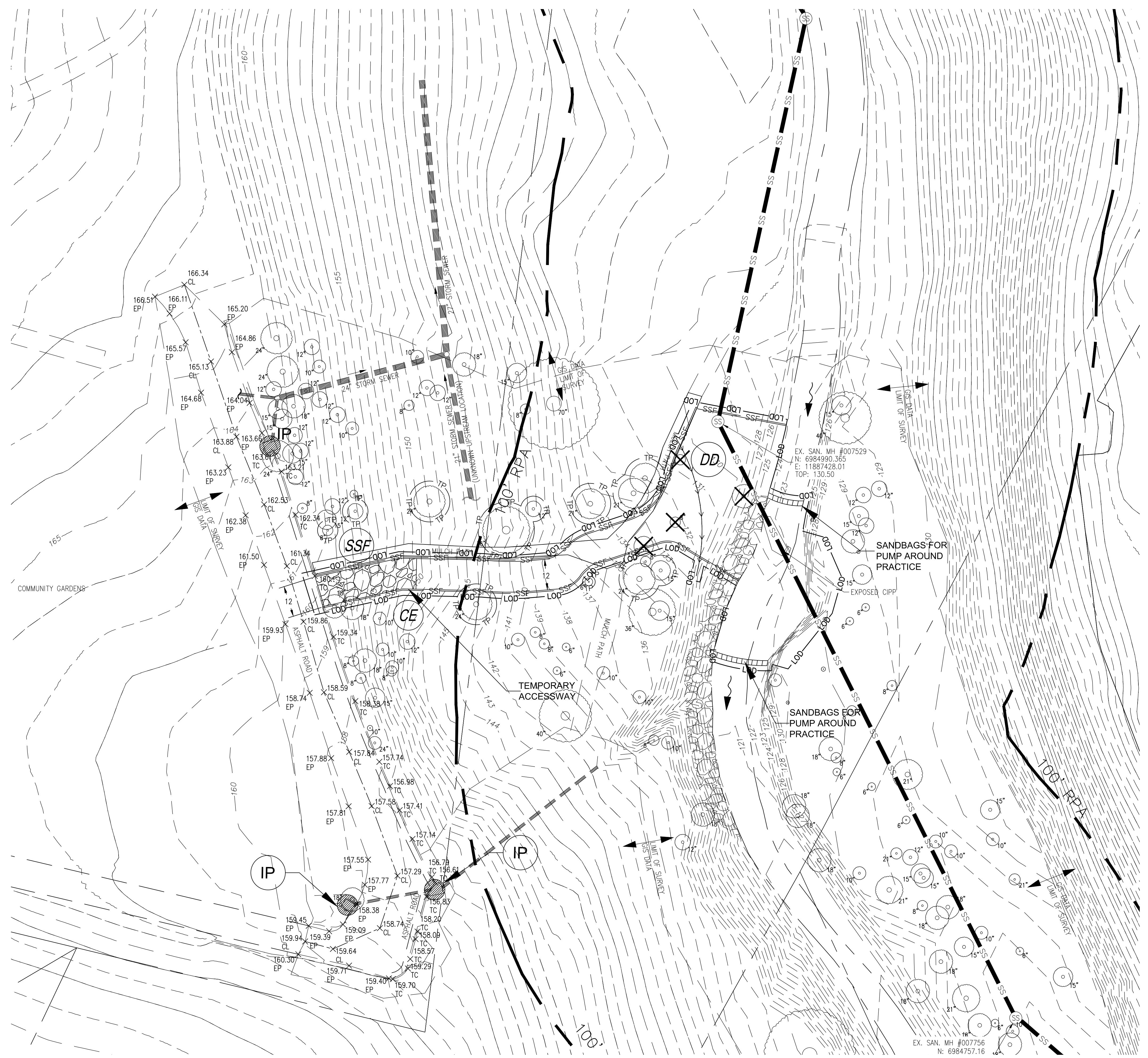
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TAYLOR RUN SANITARY SEWER STREAM CROSSING REPAIR

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C-09
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SHEET 09 OF 10

EROSION AND SEDIMENT CONTROL PLAN

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