# CONTRACT DOCUMENTS
# and
# TECHNICAL SPECIFICATIONS

**for**

# JAMESTOWN CRESCENT
# CULVERT REPLACEMENT

**December 2012**

City of
Norfolk


**Department of Public Works**

7th Floor, City Hall Building
Norfolk, Virginia 23510
(757) 664-4631

**CITY OF NORFOLK**

**JAMESTOWN CRESCENT CULVERT REPLACEMENT**

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**Posted: November 30, 2012**

**INVITATION FOR BIDS**
**CITY OF NORFOLK - DEPARTMENT OF PUBLIC WORKS**

PROJECT: **JAMESTOWN CRESCENT CULVERT REPLACEMENT**

| | | | |
|---|---|---|---|
| Owner: | City of Norfolk<br>Department of Public Works<br>Room 700, 7th floor, City Hall Building<br>810 Union Street, Norfolk, VA 23510 | A&E: | Moffatt & Nichol<br>800 World Trade Center West<br>Norfolk, VA 23510 |
| | Contact: Christine Atkinson, P.E.<br>Tel: (757) 664-4603 / Fax: (757) 664-4647 | Contact:<br>Tel: | Jousha Hill, P.E.<br>(757) 628-8222 |

**********

Sealed bids are to be received in City of Norfolk Public Works Department, Attn: Contracts Office, Room 700, 7th floor, City Hall Building, 810 Union Street, Norfolk, VA 23510 until **1:30 p.m., Thursday, January 3, 2013** for the above titled Project. **A Pre-Bid Conference will be held at 9:00 a.m., Thursday, December 13, 2012 in the 7th Floor Conference Room, City Hall Building, 810 Union Street, Norfolk. The conference is non-mandatory but highly encouraged.**

The Work under this project consists of the replacement of a severely deteriorated culvert with a new concrete, VDOT, single barrel box culvert with wingwalls and riprap, pavement resurfacing, and water line relocation. The new culvert will include a 10' wide bike path.

Bidding Documents are available from the Department of Public Works, provided on a CD, upon non-refundable payment of **$5.00 per set** in the form of a check made payable to Treasurer, City of Norfolk. Cash payments will not be accepted.

A copy of the Bidding Documents will be on file and open to inspection at The Builders and Contractors Exchange, Inc., Norfolk, VA (757-858-0680), The Builders and Contractors Exchange, Inc., Richmond, VA (804-353-8640), McGraw-Hill Construction-Dodge, Richmond, VA (804-343-2701), Reed Construction Data, Norcross, GA (800-467-2860), Valley Construction News, Richmond, VA (804-674-0397), and Hispanic Contractors Association-Carolinas, Columbia, SC (877-227-1680 ext. 8054).

A Bid Bond, certified check, or cashier's check made payable to the Treasurer, City of Norfolk, for 5% of total bid must accompany each bid. State Contractor registration class and number is required on the outside of the envelope. State Contractor registration class and number is required on the outside of the envelope.

The City reserves the right to cancel the bid opening or to reject any or all bids in whole or part, when it is in the best interest of the City. The right to waive informalities and to determine responsiveness of any bid and responsibility of all bidders is reserved to the City.

Withdrawal of bids will be in accordance with Section 33.1-42.1 of the Norfolk City Code and Section 11-54 of The Code of Virginia, 1950 (as amended).

John M. Keifer
Director

The Virginian Pilot – December 2, 2012

# INSTRUCTIONS TO BIDDERS

## 1. AUTHORIZATION TO TRANSACT BUSINESS IN THE COMMONWEALTH

(a) Bidder or offeror organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 to include in its bid or proposal the identification number issued to it by the State Corporation Commission.

(b) Any bidder or offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall include in its bid or proposal a statement describing why6 the bidder or offeror is not required to be so authorized.

## 2. SUBMISSION OF BIDS

(a) Make all bids on "Bid Form" and seal in opaque envelope. The name of project, the contractor's name, address, and Virginia Contractor Registration Class and Number shall be placed on the outside of the envelope.

(b) If a contract is for $120,000.00 or more, or if the total value of all such construction, removal, repair, or improvements undertaken by the bidder within any 12 month period is for $750,000.00 or more, the bidder is required under Title 54, Chapter 11, Code of Virginia, 1950 (as amended), to show evidence of being licensed as a Class A Contractor. If a contract is $7,500.00 or more, but less than $120,000.00, or if the total value of all such construction, removal, repair or improvements undertaken by the bidder within any 12 month period is less than $150,000, the bidder is required to show evidence of being licensed as a Class B Contractor. If a contract is $1,000 or more, but less than $7,500, or if the total value of all such construction, removal, repair or improvements undertaken by the bidder within any 12 month period is less than $150,000, the bidder is required to show evidence of being licensed as a Class C Contractor. The bidder shall place on the bid above its signature its Virginia Contractor Registration Class and Number. If a contract is less than $1,000.00, licensure is not required under Title 54, Chapter 11, Code of Virginia, 1950 (as amended).

(c) If bids are submitted by mail, enclose the above noted envelope in a second sealed, opaque envelope and address to: **City of Norfolk, Department of Public Works, Attn: Contracts Office, Room 700, 7th floor, City Hall Building, 810 Union St., Norfolk, VA 23510.** Bids submitted by mail must be received at the above address before the time designated for bid opening.

(d) Fully fill in all blanks in ink or typewritten**,** and state numbers in both writing and figures. Signatures shall be in longhand with name and title printed below. Bidders shall acknowledge all addenda in spaces provided on the bid form. For unit price contracts, in the event of a discrepancy between the Total Base Bid and the total of the extension of unit prices, the total extension of unit prices governs in determining the bid amount. For unit price contracts, in the event of a discrepancy between the extension of unit prices and the unit prices, the unit prices governs in determining the bid amount.

(e) Interlineations, alterations, and irregularities of any kind may be cause for rejection of the bid. Erasures or any physical changes on the form shall be initialed by the Bidder.

(f) Bidders may withdraw a bid after it has been submitted to the City any time prior to the stipulated time for opening such bids. Withdrawal of bids will be in accordance with Section 33.1-42.1 of the Norfolk City Code and Section 2.2-4330 of the Code of Virginia, 1950 (as amended).

## 3. EXAMINATION OF SITE

The bidder shall be responsible for having ascertained all pertinent local and existing conditions determinable by inspection and inquiry both on the site and adjacent thereto, including any other work being performed thereon, and shall include in its bid all cost attendant upon problems arising from said conditions existing at the time of

submission of its bid.

Reference is made to the Contract Documents for information relating to reports, explorations, underground facilities, and easements. On request, the owner will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests and studies as each Bidder deems necessary for submission of a Bid. The Bidder must fill all holes, clean up, and restore the site to its former condition upon completion of such explorations, investigations, tests and studies, and hold the Owner harmless from any damage to property or injury to persons resulting from or arising out of such explorations, investigations, tests, and studies.

## 4. INQUIRIES, INTERPRETATION AND ADDENDA

Should a bidder find discrepancies in, or omissions from, the drawings or documents, or should it be in doubt as to their meaning, it should at once notify the Owner in writing. The Owner will welcome such inquiries and they will be given consideration. Every interpretation made by the Owner will be in the form of a printed addendum which will be on file in the office of the Owner. Addenda will be sent to each bidder, but it will be the bidder's responsibility to know of, examine and become familiar with all addenda issued. All addenda shall become a part of the Contract Documents. The Owner will not be responsible for any oral instruction.

The submission of a Bid will constitute inconvertible representation by the Bidder that the Bidder has complied with every requirement of this Section, that without exception, the Bid is premised upon the agreement by the Bidder to perform the Work required by the Contract Documents, and applying specific means, methods, techniques, sequence or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents, that the Bidder has given Written Notice to the Owner of all conflicts, errors, ambiguities, and discrepancies that the Bidder has discovered in the Contract Documents and the written resolutions thereof by the Owner is acceptable to the Bidder, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions of performance and furnishing the Work.

## 5. BID GUARANTEE

Bids shall be accompanied by a bid guarantee of five percent (5%) of the amount of the total bid including all additive alternates, if any, and may be a certified check or cashier's check or a Bid Bond, made payable to**: Treasurer, City of Norfolk.** Such bid bond or check shall be submitted with the understanding that it shall guarantee that the bidder will not withdraw its bid during the period of sixty (60) days following the opening of bids; that if its bid is accepted, it will enter into a Contract with the Owner in accordance with a form of agreement acceptable to and approved by the Owner and that the required Performance and Payment Bonds will be given; and that in the event of the withdrawal of said bid within said period, or failure to enter into said contract and given said bonds within ten (10) days after it has received notice of acceptance of its bid, the bidder shall be liable to the Owner for the full amount of the bid guarantee as representing the damage to the Owner on account of the default of the bidder in any particular thereof. The bid bonds and checks will be returned to the bidders after the Owner and the lowest, responsive, responsible bidder have executed a contract. If the required contract has not been executed within sixty (60) days after the date of the opening of the bids, then the bond or check of any bidder will be returned upon its request, provided it has not been notified of the acceptance of its bid prior to the date of such request.

## 6. PERFORMANCE AND PAYMENT BOND

The Contractor shall furnish a performance bond and a labor and material payment bond each in the amount of 100% of the contract price. Said bonds shall be delivered to the Owner (in duplicate) and shall be approved by the Owner prior to the execution of a construction contract between the Contractor and the Owner. Bonds shall be City of Norfolk standard form and shall be in accordance with Section 33.1-76 of the Norfolk City Code. All costs of bonds shall be paid by the Contractor. A bond rider will be required should change orders increase the amount of the contract by $100,000 or more.

## 7. NEGOTIATIONS WITH APPARENT LOW BIDDER

The City reserves the right to negotiate with the lowest, responsive, responsible bidder if the bid exceeds available funds. Negotiations may include reduction in bid price, modification and/or reduction in scope of the work, substitution of materials, or any other alterations to the work so that the low bid is reduced to within available funds including a reasonable fund balance for contingency funds to be available during the course of construction.

## 8. TIME OF COMPLETION

(a) Time is of the essence. **Work is not permitted to interfere with bus routes for Norfolk Public Schools or Saint Patrick Catholic School. All on-site work requiring road or lane closures shall commence the day after the last day of the Norfolk Public Schools 2012-2013 school year and must be completed, with all road or lane closures and traffic control measures removed, no later than August 21, 2013.**

(b) Work shall not commence until the Contractor has received a fully executed copy of the Contract which authorizes the Work and has also received a Notice to Proceed issued by the authorized City representative. Work commenced prior to receipt of both a fully executed copy of the Contract and a written Notice to Proceed from an authorized City official shall be deemed unauthorized and such work will progress solely at Contractor's risk.

## 9. NON-DISCRIMINATION CLAUSE

The Contractor agrees to comply, and to require all suppliers and subcontractors paid in whole or in part from funds made available under this contract to comply with Section 122(a)(1) of the State and Local Fiscal Assistance Act of 1972 (P. L. 92-512), as amended, to wit:

"No person in the United States shall, on the grounds of race, color, national origin, or sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity of a State government or unit of local government, which government or unit receives funds made available under Subtitle A (of Title I of the Act.)

Any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975 or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973 shall also apply to any such program or activity.

Any prohibition against discrimination on the basis of religion, or any exemption from such prohibition, as provided in the Civil Rights Act of 1964 or Title VIII of the Act of April 11, 1968, hereafter referred to as the Civil Rights Act of 1968, shall also apply to any such program or activity."

Further, the Contractor agrees to comply with Section 33.l-53 of the Code of the City of Norfolk, Virginia 1979, as amended, regarding prohibited employment discrimination.

## 10. MINORITY BUSINESS CLAUSE

It is the policy of the City of Norfolk to facilitate the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities and to encourage their participation in the City's procurement activities. Toward that end, the City encourages these firms to compete and encourages non-minority firms to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Bidders (offerors) are asked, as part of their submission, to describe any planned use of such businesses in fulfilling this contract.

## 11. NON-COLLUSION AFFIDAVIT

(a) Every bidder, by submitting a bid, shall be deemed to covenant, with regard to said bid, as follows:

(1) that said bid was arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor.

(2) that, unless otherwise required by law, the prices which have been quoted in the bid submitted have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.

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

A bid shall not be considered for award nor shall any award be made where the bidder shall have failed to comply with a(1), a(2), or a(3) above.

(b) Every bidder, in addition to making the above covenants (a)(1), (a)(2) and (a)(3) will be required to provide the City of Norfolk, with the bid submitted, the affidavit contained herein.

(c) Every bidder will be required to disclose, with the submitted bid, the following information:

(1) the correct mailing address of the bidder.

(2) if a corporation, the name and current mailing address of the President, the Secretary and the Treasurer of the corporation.

(3) if a partnership, proprietorship or other firm, the name and current mailing address of each partner, proprietor or member of said firm.

(4) whether or not the bidder is associated with; owns, in whole or in part; or is owned, in whole or in part, or is a subsidiary of, any other bidder.

(d) The fact that a bidder (1) has published price lists, rates or tariffs covering items included in the submitted bid; (2) has informed prospective customers of proposed or pending publication of new or revised price lists for such items; or (3) has sold the same items to other customers at the same prices being bid, does not constitute a disclosure within the meaning of Subparagraph 9(a).

(e) Any bid submitted by a corporate bidder shall be deemed to have been authorized by the Board of Directors of the bidder and such authorization shall be deemed to include the signing and submission of the bid and the execution of the affidavit required in (b) above as the acts and deeds of the corporation.

**12. SUBSTANCE ABUSE AND DRUG-FREE WORK PLACE**

The Contractor agrees to comply with Section 33.1-58 of the Code of the City of Norfolk, Virginia, 1996, as amended, regarding substance Abuse and Drug-Free Work Place Policy.

| | |
|---|---|
| Bids to be opened: | **1:30 p.m., Thursday** |
| | **January 3, 2013** |
| Work to be Completed by: | **August 21, 2013 (See Paragraph 8 of the Instruction to Bidders)** |
| Liquidated Damages: | **$1,000.00 per day to Substantial Completion** |
| | **$200.00 per day to Final Completion** |
| Performance Bond: | **100%** |
| Payment Bond: | **100%** |
| Bid Bond: | **5%** |

**BID FORM**

To: City of Norfolk
Department of Public Works
810 Union Street, Room 700
Norfolk, Virginia 23510

A. **UNIT PRICE BID**

In compliance with the Invitation for Bids and Instructions to Bidders, the General and Supplementary Conditions of the Contract, the contract drawings and specifications titled **JAMESTOWN CRESCENT CULVERT REPLACEMENT** and all addenda issued to date, all of which are part of this bid, the undersigned hereby proposes to furnish all items, including materials, labor, and equipment called for by, and in strict accordance with Contract Documents and the list of unit prices hereto attached and referred to as Attachment A, for the sum of:

$_____

(Use words)

_____Dollars ($_____)

B. **ADDENDA**

The undersigned acknowledges receipt of the following addenda:

Addendum No._____Dated:_____

Addendum No._____Dated:_____

Addendum No._____Dated:_____

Addendum No._____Dated:_____

We agree to enter into a contract with the City of Norfolk, Virginia within ten (10) days of the award of same to us for the price named in our bid.

It is expressly agreed by us that the City of Norfolk, Virginia shall have the right to reject any and all bids and to waive any informalities.

In default of the performance on our part of the conditions of bid, our failure to enter into a contract with the City of Norfolk, Virginia, within the time above set, we herewith furnish a certified check, cashier's check (or Bid Bond) in the amount of $_____, which shall be forfeited as liquidated damages to the City of Norfolk, Virginia, but otherwise the said check or Bid Bond shall be returned.

We agree to begin work at any time after receipt of the Notice to Proceed from the Director of Public Works and complete all of the on-site Work between the day after the last day of the Norfolk Public Schools 2012-2013 school year and August 21, 2013.

C. Norfolk Businesses: It is the policy of the City to support Norfolk businesses and workforce development and it encourages companies with corporate offices in Norfolk and which employ Norfolk residents to compete for City contracts. Bidders are asked, as part of their submission, to advise of their Norfolk location and detail their employment of Norfolk residents.

D. Equal Opportunity Business Development: It is the policy of the City of Norfolk to facilitate the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities and to encourage their participation in the City's procurement activities. Toward that end, the City encourages these firms to compete and encourages non-minority firms to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Bidders (offerors) are asked, as part of their submission, to describe any planned use of such businesses.

1. Is your firm a minority owned business? Yes ___ No ___ If yes, please check the appropriate category: ___ African American (male), ___ African American (female), ___ Caucasian (female), ___ Hispanic (male), ___ Hispanic (female), ___ Asian American (male), ___ Asian American (female), ___ American Indian (male), ___ American Indian (female), ___ Eskimo (male), ___ Eskimo (female), ___ Aleut (male), ___ Aleut (female), ___ Other (male), ___ Other (female).

2. Subcontracting Opportunities for Small, Women Owned, Minority Business Enterprises and Disabled Veterans. All prime contractors are requested to furnish the following information regarding participation of small, women owned, minority business enterprises and disabled veterans:

a. Proposed Name of your Subcontractor(s):

b. Proposed Minority Category of Subcontractor(s) - please check the appropriate category(ies):

| | |
|---|---|
| ___ African American (male) | ___ African American (female) |
| ___ Hispanic (male) | ___ Hispanic (female) |
| ___ Asian American (male) | ___ Asian American (female) |
| ___ American Indian (male) | ___ American Indian (female |
| ___ Eskimo (male) | ___ Eskimo (female) |
| ___ Aleut (male) | ___ Aleut (female) |
| ___ Other (male) | ___ Caucasian (female) |

| | |
|---|---|
| | ___ Other (female) |

c. Proposed Amount of Subcontracts:

d. Proposed Description of commodity (i.e. masonry, hauling, insulation, etc.):

e. Proposed Description of Project:

f. Proposed Total value of awards to all subcontractors:

g. Proposed Total Number of minority subcontracts awarded:

h. If you do not propose the use of any subcontractors, please check here ____.

E. The undersigned has read all sections under "Instructions to Bidders."

F. **CONTRACTOR'S REGISTRATION AND SIGNATURE**

Registered Virginia Contractor Class and No._____

City of Norfolk Business License No. _____

Contractor_____ Signed_____ (SEAL)

Date_____ Title_____

NOTE: If Bidder is a corporation, write state of incorporation under signature and if a partnership, give full names of all partners.

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**AFFIDAVIT**

City of Norfolk, Virginia project: **Jamestown Crescent Culvert Replacement**

Bid Date:_____

**STATE OF VIRGINIA**
(City/County)

This day personally appeared before the undersigned, a Notary Public in and for the City/County and State aforesaid, _____, who having been first duly sworn
(name of owner, partner, president)
according to law, did depose and aver as follows:

(a) That he is_____
(owner, partner, president, etc.)

of_____
(insert name of contractor)

(b) That he is personally familiar with the bid of _____
(insert name of contractor)
submitted in connection with the above captioned City of Norfolk project.

(c) That said bid was formulated and submitted in good faith as the true bid of said bidder.

(d) That said bid in no manner violates the Sherman Antitrust Act (15 U.S.C. '1 *et seq.*), The Virginia Antitrust Act ( n59.1-9.1 through n59.1-9.17 Code of Virginia, (1950), as amended) or the Conspiracy to Rig Bids to Government Act (nn59.1-68.8, Code of Virginia (1950), as amended.

And further this deponent saith not.

_____
**Affiant**

Subscribed and sworn to before me this_____day of_____, 20___.

My commission expires:_____, 20___

_____
**Notary Public**

MAILING ADDRESS, FAX AND TELEPHONE NUMBER OF BIDDER:

_____

_____

_____

IF CORPORATION, PROVIDE NAME AND MAILING ADDRESS AS REQUIRED BELOW

| PRESIDENT | SECRETARY | TREASURER |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

IF PARTNERSHIP, PROPRIETORSHIP, OR OTHER FIRM, PROVIDE NAME AND MAILING ADDRESS OF EACH PARTNER, PROPRIETOR, OR MEMBER OF FIRM.

| | | |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

**End of Page**

**COMPLIANCE WITH STATE LAW**

**AUTHORIZATION TO TRANSACT BUSINESS IN THE COMMONWEALTH**

I. **CERTIFICATION**

A. The Bidder/Vendor (Please fill in with your enterprise's complete name)

_____

certifies that it is organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50.

The identification number issued to Bidder/Vender by the State Corporation Commission: _____

B. Bidder/Vendor that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall describe why it is not required to be so authorized:

_____

_____

_____

Bidder/Vendor:_____

Signed: _____

Title: _____

Date: _____

II. **INSTRUCTIONS**

a. The Bidder/Vendor shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Vendor learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

b. A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Bidder's/Vendor's responsibility. Failure of the Bidder/Vendor to furnish a certification or provide such additional information as requested by the appropriate City purchasing official may render the Bidder/Vendor non-responsible.

c. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of a Bidder/Vendor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

d. The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Bidder/Vendor knowingly rendered an erroneous certification, in addition to other remedies available to the City, the appropriate City purchasing official may terminate the contract resulting from this solicitation for default.

**End of Page**

**SCHEDULE OF UNIT PRICES**
**MAJESTIC AVENUE SIDEWALK & STREET IMPROVEMENTS**
**OWNER: CITY of NORFOLK, VIRGINIA**

The unit prices have been computed in accordance with Paragraph 7.3.3.2 of the General Conditions of the Contract. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents. The prices quoted shall include, without exception, all materials, labor, equipment, appliances, clean-up, applicable sales, use and other taxes, building permits or fees, and the Contractor's labor, overhead, profit, mobilization and other mark-ups, and in full accordance with the Specifications. Include allowance for waste where appropriate. The unit prices shall be maintained throughout the contract period. Unit prices shall be used in determining additions or deductions from the TOTAL CONTRACT AWARD amount in the event of changes in the work.

| Item # | Description | Unit | Qty | Price | Extension |
|---|---|---|---|---|---|
| 1 | Mobilization / Demobilization | LS | 1 | | |
| 2 | Stormwater Demolition | LS | 1 | | |
| 3 | Waterline Demolition | LS | 1 | | |
| 4 | Sidewalk Demolition | SF | 517 | | |
| 5 | Curb & Gutter Demolition | LF | 195 | | |
| 6 | Asphalt Demo (Milling) | SY | 950 | | |
| 7 | Culvert & Miscellaneous Demolition | LS | 1 | | |
| 8 | Grading | LS | 1 | | |
| 9 | Rip Rap | TON | 150 | | |
| 10 | Structure with wingwalls | LS | 1 | | |
| 11 | 15” RCP Stormwater Pipe | LF | 11 | | |
| 12 | Std. Curb Inlet | EA | 1 | | |
| 13 | Sidewalk Installation | SF | 337 | | |
| 14 | Curb & Gutter Installation | LF | 195 | | |
| 15 | Aggregate Base Course | CY | 70 | | |
| 16 | Asphalt (BM-25) | TON | 40 | | |
| 17 | Asphalt (SM-9.5A) | TON | 125 | | |
| 18 | Waterline & Fittings | LF | 212 | | |
| 19 | Butterfly Valve | EA | 1 | | |

**Attachment A-1**

| Item # | Description | Unit | Qty | Price | Extension |
|---|---|---|---|---|---|
| 20 | Waterline Service with Meter | EA | 1 | | |
| 21 | PZC Steel Sheet Pile Wall | TON | 7 | | |
| 22 | Miscellaneous Site Civil | LS | 1 | | |
| | **TOTAL BID** | | | | |

_____
CONTRACTOR'S PRINTED NAME

_____
CONTRACTOR'S SIGNATURE

**Attachment A-2**

# THE CITY OF NORFOLK, VIRGINIA

**OFFICE OF THE CITY MANAGER**

# CONTRACT

**THIS AGREEMENT**, made as of the ___ day of ____ in the year **2012**, is between the **City of Norfolk, Virginia**, acting by and through the City Manager, hereinafter styled the **City**, and

party of the second part, hereinafter styled the **Contractor**.

**WITNESSETH,** That whereas the City has awarded to the Contractor, in accordance with his bid of **January 3, 2013** a contract for **JAMESTOWN CRESCENT CULVERT REPLACEMENT** as described in specifications and drawings prepared therefor by **Moffatt & Nichol, 800 World Trade Center West, Norfolk, Virginia 23510** hereinafter styled the Engineer, or by the City of Norfolk, and on file in the office of the Director of Public Works of the City of Norfolk, Virginia.

## ARTICLE 1 - THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others.

## ARTICLE 2 - DATE OF COMMENCEMENT AND COMPLETION TIMES

The Contractor further agrees to begin Work at such a date as the Director of Public Works Department, Norfolk, Virginia, shall notify him to begin via a Notice to Proceed letter, and that he will commence all on-site work requiring road or lane closures and traffic control measures after the last day of the Norfolk Public Schools 2012-2013 school year, and achieve Substantial Completion of the entire Work in accordance with Paragraph 9.8 of the General Conditions **not later than August 21, 2013**, as well as achieve Final Completion in accordance with Paragraph 9.10 of the General Conditions not later than **thirty (30) consecutive calendar days** following the date of Substantial Completion. The last day of the Norfolk Public Schools school year is scheduled for June 13, 2013, but may be extended to June 17, 2013, as required for inclement weather make-up days.

## ARTICLE 3 - LIQUIDATED DAMAGES

The Contractor and the City recognize that time is of the essence of this Agreement. In view of the difficulty of ascertaining the loss which the City will suffer by reason of delay in the performance of the Work, the Contractor and the City hereby agree upon as the liquidated damages set below that the City will suffer by reason of delay and/or default, and not as a penalty. Further, the City shall deduct and retain the amount of such liquidated damages out of the moneys which may be due or become due to the Contractor under this Agreement.

Accordingly, should the Contractor fail to achieve Substantial Completion of the aforesaid Work in

accordance with the contract documents to the satisfaction and approval of the Engineer within the time stipulated in Article 2 above, the Contractor shall pay to the City of Norfolk, Virginia, **One Thousand Dollars and Zero Cents ($1,000.00**) for every calendar day beyond the time set for substantial completion until the Work is substantially complete.

Starting from the date when Substantial Completion has been achieved, should the Contractor fail to achieve Final Completion of the aforesaid Work in accordance with the contract documents to the satisfaction and approval of the Engineer within the time stipulated in Article 2 above, the Contractor shall pay to the City of Norfolk, Virginia, **Two Hundred Dollars and Zero Cents ($200.00)** for every calendar day beyond the time set for Final Completion until the total project is fully complete and ready for final payment.

**ARTICLE 4 - CONTRACT PRICE**

The City shall pay the Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined below subject to additions and deductions as provided in the Contract Documents:

For all Unit Price Work, an amount equal to the sum of the established unit prices hereto attached and referred to as Attachment A, for:

**_____ Dollars and ___ Cents ($XXX.XX)**

As provided in Subparagraph 7.3.3.2 of AIA A201-2007, General Conditions of the Contract for Construction (as modified), estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by the Engineer's recommendation to the City.

**ARTICLE 5 - PAYMENTS**

Based upon applications for payment submitted to the Engineer by the Contractor and certificates for payment issued by the Engineer, the City shall make monthly progress payments on account of the contract sum to the Contractor as provided in the conditions of the contract as follows:

The City will pay the Contractor, on or about the thirtieth calendar day after receipt of a Request for Payment, ninety-five percent (95%) of the portion of the contract sum properly allocable to labor, materials, and equipment incorporated in the Work and ninety-five percent (95%) of the portion of the contract sum properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing by the parties, less the aggregate of previous payments in each case; provided, however, that the owner, at any time after fifty percent (50%) of the Work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining partial payments in full; and upon final completion, a sum sufficient to increase the total payment to one-hundred percent (100%) of the contract sum, less such retainage as the Engineer shall determine for all incomplete Work and unsettled claims. But such full payment or payments shall in no manner be construed as reducing the amount of the bond, or the liability of the surety thereon, until final completion and acceptance of all items of Work herein set forth.

The action of the Engineer by which the Contractor is to be bound according to the terms of this contract shall be that evidenced by his final estimate and certificate, all prior estimates upon which ninety-five percent (95%) or more may be made, being merely payment on account, and not payments

for accepted Work, and subject to the correction of such final estimate, which may be made with notice to the Contractor.

## ARTICLE 6 - CONTRACTOR'S REPRESENTATION

To induce the City to enter into this Agreement, the Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site which have been provided with the Contract Documents, and (2) reports and drawings of a hazardous environmental condition, if any, at the site, which have been provided with the Contract Documents.

E. Contractor has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work.

F. Contractor is aware of the general nature of Work to be performed by City and others at the Site that relates to the Work as indicated in the Contract Documents.

G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor

H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

I. Contractor hereby certifies that it has familiarized itself with Sections 33.1-86 through 33.1-93 of the Code of the City of Norfolk, Virginia, 1979, as amended, entitled "Ethics in Public Contracting," including the additional statutes set forth in Section 33.1-86 thereof, and further that all amounts received by the Contractor pursuant to this Agreement are proper and in accordance therewith.

J. Contractor hereby certifies that at all times during which any term of this Agreement is in effect, it does not and shall not knowingly employ any unauthorized alien. For purposes of this section, an "unauthorized alien" shall mean any alien who is neither lawfully admitted for permanent residence in the United States nor authorized to be employed by either Title 8, section 1324a of the United States Code or the U.S. Attorney General.

K. Contractor hereby represents that it is organized as a stock or non-stock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership and is authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 or as otherwise required by law.

**ARTICLE 7 - CONTRACT DOCUMENTS**

The Contract Documents consist of the following:

a. Invitation for Bids

b. Instructions to Bidders

c. Bid Form/Affidavit

d. Bid Bond

e. Contract Agreement

f. Performance Bond

g. Payment Bond

h. AIA A201-2007, "General Conditions of the Contract for Construction" (as modified)

i. Certificate of Insurance

j. Notice of Award

k. Notice to Proceed

l. Change Orders (if any)

m. Other Documents as may be required by law or appended hereto

n. Plans and Drawings prepared by: **Moffatt & Nichol, 800 World Trade Center West, Norfolk, Virginia 23510.**

o. Specifications prepared or issued by: **Moffatt & Nichol, 800 World Trade Center West, Norfolk, Virginia 23510.**

p. Addendum (as listed in Bid Form)

**End of Page**

Witness the following signatures and seals:

**Witness:**

_____ _____**(SEAL)**

By:_____**(SEAL)**

Seal if Incorporated

_____**(SEAL)**
Title

Virginia State Contractor's License No. _____

City of Norfolk Business License No. _____

**Contents Approved:** _____
Director of Public Works

**Approved as to form and correctness:** _____
Deputy City Attorney

**CITY OF NORFOLK, VIRGINIA**

By_____
City Manager

**Attest:**_____
City Clerk

**********

I hereby certify that the money required for this contract (agreement, obligation or expenditure) is in the City Treasury to the credit of the fund from which it is to be drawn, and not appropriated for any other purpose.

Account: _____ Amount: _____

Contract No.: _____ Vendor Code: _____

_____
Director of Finance and Business Services Date

**THIS**

**PAGE**

**INTENTIONALLY**

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# PERFORMANCE BOND

Bond No. _____
Amount: **$**_____

KNOW ALL PERSONS BY THESE PRESENTS, that _____, hereinafter called the Contractor and _____ a corporation duly organized and existing under and by virtue of the laws of the State of _____, hereinafter called the Surety, and authorized to transact business within the Commonwealth of Virginia as the Surety, are held and firmly bound unto the City of Norfolk as Owner, in the sum of **_____ DOLLARS AND ____ CENTS ($_____.00)**, lawful money of the United States of America, for payment of which, well and truly be made to the Owner, the Contractor and the Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the Contractor has executed and entered into a certain Agreement, hereto attached, with the Owner dated **_____, 2012**, for

**JAMESTOWN CRESCENT CULVERT REPLACEMENT**

NOW THEREFORE, if the Contractor, and its successors and assigns, shall at all times duly, promptly, and faithfully perform the Work and any alteration in or addition to the obligations of the Contractor arising thereunder, including the matter of infringement, if any, of patents or other proprietary rights, and shall assure all guarantees against defective workmanship and materials, including the guarantee period following final completion by the Contractor and final acceptance by the Owner and comply with all the covenants therein contained in the Specifications, Drawings, and other Contract Documents required to be performed by the Contractor, in the manner and within the times provided in the Agreement, and shall fully indemnify and save harmless the Owner from all costs and damage which it may suffer by reason or failure to do so, and shall fully reimburse and repay it all outlay and expenses which it may incur in making good any default, and reasonable counsel fees incurred in the prosecution of or defense of any action arising out of or in connection with any such default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that the Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the Work to be performed thereunder, or payment thereunder before the time required therein, or waiver of any provision thereof, or assignment, subletting or transfer thereof or any part thereof, shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, addition to the terms of the Contract Documents or any such payment, waiver, assignment, subcontract or transfer.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

Whenever Contractor shall be declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Owner shall have the right, at its option, to require the Surety to promptly proceed to remedy the default within 30 days of notice by proceeding or procuring others to proceed with completing the Agreement with its terms and conditions including the correction of any defective work and the provision of safety measures required as the result of such default; and all reserves, deferred payments, and other funds provided by the Agreement to be paid to Contractor shall be paid to Surety at the same times and under the same conditions as by the terms of that Agreement such fund would have been paid to Contractor had the Agreement been performed by Contractor; and Surety shall be entitled to such funds in preference to any assignee of Principal of any adverse claimant. Notwithstanding the above, the Owner shall have the right, with

the approval of the Surety which shall not be unreasonably withheld, to take over and assume completion of the Agreement and be promptly paid in cash by the Surety for the cost of such completion less the balance of the Contract price.

IN WITNESS WHEREOF, all above parties bounded together have executed this instrument this _____ day of _____, 2012, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

**(_____)**

By:_____(Seal)

Name:_____

Title: _____

_____
Attest

SURETY

_____

By:_____(Seal)

_____
Attest

APPROVED AS TO FORM: _____, 2012

City of Norfolk, OWNER

By: _____
Deputy City Attorney

NOTE: Date of Bond shall not be prior to the date of the Agreement. If the Contractor is a partnership, all partners shall execute the Bond.

IMPORTANT: The Surety named on this Bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent shall be accompanied by a certified copy of the authority to act for the Surety at the time of signing of this Bond.

**End of Page**

# PAYMENT BOND

Bond No._____
Amount: **$**_____

KNOW ALL PERSONS BY THESE PRESENTS, that_____**,** hereinafter called the Contractor and _____, a corporation duly organized and existing under and by virtue of the laws of the State _____, hereinafter called the Surety, and authorized to transact business within the Commonwealth of Virginia as the Surety, are held and firmly bound unto the City of Norfolk as Owner, in the sum of **_____ DOLLARS AND ZERO CENTS ($_____.00)**, lawful money of the United States of America, for payment of which, well and truly be made to the Owner, the Contractor and the Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the Contractor has executed and entered into a certain Agreement, hereto attached, with the Owner dated **_____, 2012**, for

**JAMESTOWN CRESCENT CULVERT REPLACEMENT**

NOW THEREFORE, if the Contractor shall promptly make payments to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in the Agreement, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, repairs on machinery, equipment, and tools consumed, used or rented in connection with the construction of the Work, and all insurance premiums on the Work, and for all labor performed in the Work, whether by Subcontractor or otherwise, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the Work to be performed thereunder, shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, all above parties bounded together have executed this instrument this ____ day of _____, 2012, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

**(_____)**

By:_____(Seal)

Name: _____

Title: _____

_____
Attest

SURETY

_____

By: _____(Seal)

_____
Attest

APPROVED AS TO FORM: _____, 2012

City of Norfolk, OWNER

By: _____
Deputy City Attorney

NOTE: Date of Bond shall not be prior to the date of the Agreement. If the Contractor is a partnership, all partners shall execute the Bond.

IMPORTANT: The Surety named on this Bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent shall be accompanied by a certified copy of the authority to act for the Surety at the time of signing of this Bond.

**End of Page**

# AIA® Document A201™ – 2007

## General Conditions of the Contract for Construction

for the following PROJECT:
*(Name and location or address)*
Jamestown Crescent Culvert

THE CITY OF NORFOLK, a municipal corporation of the Commonwealth of Virginia, hereinafter called the "City" or the OWNER:
*(Name, legal status and address)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

THE ARCHITECT:
*(Name, legal status and address)*

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User Notes:
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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 BASIC DEFINITIONS

#### § 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

#### § 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

#### § 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### § 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

#### § 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

#### § 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### § 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### § 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

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

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them ~~as being necessary to produce the indicated results.~~ or from prevailing custom or trade usage as being required to produce the intended result whether or not specifically called for at no additional cost to the Owner. .

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§ 1.2.1.1 Should any **conflict** be found in the Contract Documents, the Engineer/Architect shall interpret or construe the Contract Documents so as to secure the most substantial and complete performance of the Work. In other words, the better quality or great quantity of work shall be provided in accordance with the Engineer's/Architect's interpretation. The Engineer's/Architect's decision in this matter shall be final.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

**§ 1.2.4** Wherever in the Contract Documents the words "as approved," "as directed," "as required," "acceptable," "satisfactory" and words of like import are used with reference to the Work or its performance, and without further qualification, it shall mean as approved, as directed, as required by the Engineer/Architect and acceptable, satisfactory, etc. to the Engineer/Architect.

**§ 1.2.5** The general character of the detailed work is shown on the Drawings, but minor modifications may be made on the shop drawings or mock-ups. Any details shall be worked out in relation to their location and their connection to other parts of the Work. Where on any drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out also apply to all other like portions of the Work. Where details or conditions are indicated but started only, such details or conditions shall be continued throughout the courses or parts in which they occur and shall also apply to all other similar parts in the Work unless otherwise indicated or specifically noted.

**§ 1.3 CAPITALIZATION**

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

**§ 1.4 INTERPRETATION**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

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

**§ 1.5.1** The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors and owners of ~~their respective Instruments of Service, including the Drawings and Specifications, and~~ them, and will retain all common law, statutory and other reserved rights, ~~including copyrights. The Contractor,~~ in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. As such, the City is hereby declared sole-owner of these documents in regards to this Project and will abide by the limitations described in Subparagraph 1.5.1. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers ~~shall not own or claim a copyright in the Instruments of Service.~~ are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants.. Submittal or distribution to meet official regulatory requirements or


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for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' copyrights or reserved rights.

~~§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.~~

§ 1.5.2. Intentionally Omitted.

**§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM**

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

**ARTICLE 2 OWNER**

**§ 2.1 GENERAL**

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

**§ 2.1.2** The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

**§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER**

~~§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

§ 2.2.1. Intentionally Omitted.

**§ 2.2.2** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise specified, the following applies:

Water line taps, construction of pits for water taps and meter, and restoration of the area to its original condition shall be performed by the Contractor at its expense. Only new water meters shall be installed by City forces at the expense of project sponsor (i.e. the City or private developer). All the aforementioned shall be coordinated by the Contractor.

Sanitary taps and cleanouts shall be done by the Contractor or its Subcontractor at the Contractor's expense. HRSD tap fees will be paid by the Owner.


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For gas and electrical work and associated meter installations, Contractor shall be responsible for complete coordination of work with utilities, including provision of all necessary labor, equipment, and materials as required in the Contract Documents as well as payment of all resulting costs to aforesaid Work.

For telephone and cables, Contractor shall be responsible for coordination of telephone trunk line and cable installation with telephone/television company to the "point of penetration" to the facility, including provision of all necessary labor, equipment, and materials as required in the Contract Documents as well as payment of resulting costs to all aforesaid work.

**§ 2.2.3** The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner , subject to Subparagraph 3.7.4, but shall exercise proper precautions relating to the safe performance of the Work.

**§ 2.2.3.1** The Contractor shall be responsible for protecting pins, stakes, marks, hubs, and control points. Replacement of damaged or destroyed pins, stakes, marks, hubs or control points shall be conducted under the supervision of a surveyor licensed in the Commonwealth of Virginia, if required by the City, and at the Contractor's expense. The Contractor shall coordinate with the Surveys Division of the Department of Public Works (664-4645) prior to resetting of points and shall provide certified documentation to include the reference/recovery sheet with swing ties for new benchmarks.

**§ 2.2.4** The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

**§ 2.2.5** Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one ~~copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.~~(1) CD containing the Drawings and Specifications, in PDF format, free of charge..

**§ 2.3 OWNER'S RIGHT TO STOP THE WORK**

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

**§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK**

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or ~~failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect.~~ failure.. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

**ARTICLE 3 CONTRACTOR**

**§ 3.1 GENERAL**

**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.


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§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

**§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR**

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. Any failure by the Contractor to acquaint himself with such information shall not relieve him from the responsibility for successfully performing the Work.

.1 Dimensions of Work shall not be determined by scale or rule, but figured dimensions shall be used at all times.

.2 The Contractor shall verify all dimensions by measurement at the jobsite, and shall take any and all other measurements necessary to verify the drawings and to properly layout the Work.

.3 The study of the Contract Documents by the Contractor shall be made sufficiently in advance of the actual layout of the Work so as to allow the Contract Documents to be interpreted or modified by the Engineer/Architect.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect ~~issues~~ in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. ~~If the Contractor performs those obligations, the Contractor~~ The Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, or for differences between field measurements or conditions and the Contract ~~Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.~~Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect..

**§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES**

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite

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safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

**§ 3.3.2** The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

**§ 3.3.3** The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

**§ 3.4 LABOR AND MATERIALS**

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

**§ 3.4.2** Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

**Substituted Materials.** Request for approval of any substituted material and equipment for those specified or shown on the drawings shall be made in writing to the Engineer within 30 days after award of the Contract. If this request is not submitted, the Engineer reserves the right to have the Contractor furnish the material and equipment definitely specified or shown on the plans. The Contractor shall show, in writing, the monetary savings, improvement in quality, time savings, and other factors to be gained from the proposed substitute. Approval of substitute materials and equipment will be at the sole discretion of the Engineer.

**Or Equal.** It is not the intent of these specifications to exclude or omit products or any responsible manufacturer, if said products are equal in every respect to those mentioned herein. Whenever an article, or any class of materials is specified by trade name or by name of any particular patentee, manufacturer or dealer, it shall be taken as intending to mean equal thereto in quality, finish, size, and durability and equally as serviceable for the purpose for which it is or they intended. Request for approval of any "equal" material or product for those specified or shown on the drawings shall be made in writing to the Engineer within 30 days after award of the Contract. If this request is not submitted, the Engineer reserves the right to have the Contractor furnish the material and products definitely specified and shown on the plans. The Contractor shall show, in writing, that the material or product being proposed is equal in every respect to that specified and shall provide all necessary supporting documentation requested by the Engineer. The quality shall be determined by the Engineer, and he alone shall be sole judge as to what materials or services will be accepted as equal. No substitution of materials, methods, or services specified shall be made without written approval from the Engineer.

**Materials and Equipment Manufacturer's Recommendation.** All materials, equipment or other items specified by trade or manufacturer's name shall be handled, installed, erected or connected in strict conformity with the manufacturer's recommendations and/or specifications.

By making requests for substitutions, the Contractor:

.1 Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;

.2 Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;


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.3 Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs and time extensions related to the substitution which may subsequently become apparent; and

.4 Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

**§ 3.4.3** The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

**§ 3.5 WARRANTY**

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

**§ 3.6 TAXES**

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

**§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS**

**§ 3.7.1** Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall be advised that there is NO permit fee for new construction, additions, etc. for CITY-OWNED BUILDINGS. Before final payment is made on the Project, Contractor shall demonstrate that the necessary inspections, certificates of occupancy, clearance, and/or acceptance from the City, State, Federal, and/or private entities/organizations such as from the City's Building Official, Corps of Engineers, Department of Environmental Quality, etc. have been obtained.

**§ 3.7.2** The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

**§ 3.7.3** If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

**§ 3.7.4 Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that 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, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are ~~disturbed and in no event later than 21 days after first observance of the conditions.~~ disturbed, Contractor shall not disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so "except in an emergency as required by Paragraph 10.4. . The Architect will promptly investigate such conditions and, if the Architect determines that 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, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. With respect to unforeseen Work that is paid on a Unit Price Basis, any adjustment in quantity and Contract price will be determined


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by the Engineer/Architect subject to the provisions of Subparagraph 15.1.5.3. Engineer/Architect will review with the Contractor the Engineer's/Architect's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

**§ 3.7.4.1 Possible Price and Times Adjustments.** Contractor shall not be entitled to any adjustment in the Contract Price or Contract Terms if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner in respect to Contract price and Contract times by the submission of a Bid or becoming bound under a negotiated contract; or

b. The existence of such condition could reasonably have been discovered or revealed as a result of examination, investigation, exploration, test, or stud of the Site and contiguous areas required by the bidding requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give written notice within the time and as required by Subparagraph 3.7.4.

**§ 3.7.4.2 Subsurface and Physical Conditions.** The Contract Documents identify:

a. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that the Engineer/Architect has used in preparing the Contract Documents;

b. Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that the Engineer/Architect has used in preparing the Contract Documents.

**§ 3.7.4.3 Limited Reliance by Contractor on Technical Data Authorized.** Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data", if any, shall be identified in Supplementary General Conditions. Contractor may not rely upon or make any claim against Owner, Engineer/Architect, or any of Engineer's/Architect's consultants with respect to:

a. The completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the Contractor, and safety precautions and programs incident thereto; or

b. Any Contractor interpretation of or conclusion drawn from any "technical data" or any such data, interpretations, opinions, or information.

**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

**§ 3.8 ALLOWANCES**

**§ 3.8.1** The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

**§ 3.8.2** Unless otherwise provided in the Contract Documents,

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.1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. The Contractor shall attach with monthly invoices the original copy of sales invoices/receipts for materials or equipment that are covered under allowances.

**§ 3.8.3** Materials and equipment under an allowance shall be selected by the Owner ~~with reasonable promptness.~~in sufficient time to avoid delay in the Work..

**§ 3.9 SUPERINTENDENT**

**§ 3.9.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

.1 The superintendent shall not be changed except with the consent of the Owner, unless the superintendent ceases to be in the Contractor's employ.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, and prior to mobilization or proceeding with any work on site, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

**§ 3.9.3** The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

**§3.9.4** The superintendent shall be present on the project site whenever work is being performed, unless otherwise authorized in writing by the Owner. The Contractor shall notify the Owner whenever the superintendent will be absent for four hours or more. This notification shall include the name of the designated substitute. Any substitute shall be familiar with the project and have the same authority of the primary superintendent. Verbal notification is acceptable for periods less than one full workday.

**§3.9.5** The superintendent shall serve as a day to day point of contact on the contract for the Owner and shall, as a minimum, have the authority to:

a. Act on behalf of the Contractor,

b. Direct the work of subcontractors.

c. Respond to directed changes in the schedule.

d. Provide detailed updates to and respond to inquiries from the Owner on the progress of the work.

e. Act upon verbal and written notification of non-conforming work.

f. Respond to any complaints regarding the conduct or actions of any employee of the Contractor or any subcontractor.


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## § 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

**§ 3.10.1** The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. At the Pre-Construction Conference, the Contractor shall submit to the Engineer for its timely review a preliminary construction schedule indicating the times (number of days or dates) for starting and completing the various stages of the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

.1 The progress schedule shall be in the form of a bar graph and shall identify each major or critical activity. The progress schedule shall be updated monthly. Five (5) copies of the updated progress schedule shall be submitted with each Application for Payment.

**§ 3.10.2** The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

**§ 3.10.3** The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

## § 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

## § 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

**§ 3.12.1** Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

.1 Reproduction of the Contract Drawings, or any portion thereof, shall not be acceptable.

**§ 3.12.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

**§ 3.12.4** Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.


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The Contractor, within **15 days from the Notice to Proceed,** shall submit to the Engineer/Architect for approval, a complete schedule of submittals for shop drawings and technical and/or engineering data sheets covering all items and equipment for this Contract as listed in each respective division. Submit for approval ***six (6)*** **copies of certified Shop Drawings and technical data sheets** plus sufficient copies for Contractor's use. Approval of the above submissions shall not relieve the Control from complying with the Drawings and Specifications, nor shall such approval be construed as a guarantee of the accuracy of dimensions or other covered items. The Engineer shall endeavor to process all drawings, data sheets, etc., within 21 calendar days of receipt unless impractical. Except for construction schedule and schedule of values that need to be turned over directly to the City for review/approval, the Contractor shall forward all other submittals for review/approval to only one clearing house. The City will notify the Contractor during the Pre-Construction Conference where to send these submittals.

.1 Unless otherwise directed or specified, samples shall be submitted in duplicate. Samples shall be properly labeled, bearing the name and quality of material, name of the manufacturer, name of Project, name of the Contractor and the date of submission.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, ~~or will do so~~ and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. All copies of Shop Drawings submitted for approval shall bear the following statement: "Checked and certified correct for conformance with Contract Documents." This statement shall be dated and signed by the Contractor and shall appear on each submittal. One copy of each approved submittal shall be kept at job site at all times.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

.1 The Contractor shall furnish to the field as many prints of the approved Shop Drawings as may be required.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all

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performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

### § 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

### § 3.14 CUTTING AND PATCHING

**§ 3.14.1** The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

### § 3.14.3 UNDERGROUND UTILITY DAMAGE PREVENTION ACT

The Contractor shall be required and agrees to comply with all the provisions of the Virginia Underground Utility Damage Prevention Act (Section 56-265.14, *et seq*, Code of Virginia, 1950, as amended) and hereby agrees to hold the City of Norfolk harmless against any loss, damages or claims of any nature whatsoever arising out of the Contractor's failure to comply with the requirements of said Act.

### § 3.15 CLEANING UP

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project. In addition, immediately after the completion of the Work, or any portion thereof, the Contractor shall restore the facility, street, and surrounding area to a condition as clean as before the Work was begun. The drainage system shall also be inspected and cleaned by the Contractor. If done by the City or its agents, any expense the City may incur will be charged against the Contractor and deducted before Final Payment is made. The Contractor will be required to back fill along the edges of the sidewalks, driveways and curbs where settlement has occurred, and reshape and reslope where directed. Site must be maintained regularly according to State and City regulations, including regular grass cutting. During the progress of the Work, the sidewalks and portions of the streets adjoining the Work, or in its vicinity, must not be obstructed or littered, and the adjacent sidewalks and gutters must be kept clean as directed by the Engineer.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and ~~Owner shall be entitled to reimbursement from~~ the costs thereof shall be charged to the Contractor.

### § 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

### § 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the


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Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

### § 3.18 INDEMNIFICATION

**§ 3.18.1** To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity ~~that~~ which would otherwise exist as to a party or person described in this Section 3.18.

§3.18.1.1 The requirements of this Paragraph 3.18 shall be incorporated into the Contractor's insurance policies in a manner approved by the Owner.

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

## ARTICLE 4 ARCHITECT

### § 4.1 GENERAL

**§ 4.1.1** The ~~Owner shall retain an architect~~ architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture ~~in the jurisdiction where the Project is located. That person or entity is identified as the Architect~~ identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

**§ 4.1.2** Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

~~§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.~~

§ 4.1.3. Intentionally Omitted.

### § 4.2 ADMINISTRATION OF THE CONTRACT

**§ 4.2.1** As the Owner's Project representative, the Consulting Engineer's/Architect's duties, responsibilities and limitations of authority shall be presented during the Pre-Construction Conference. The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§4.2.1.1 Engineer – An individual or entity having a contract with the Owner to furnish services as Owner's independent professional consultant with respect to the Project and who is identified as such in the Agreement.

**§ 4.2.2** The ~~Architect~~ Architect, as a representative of the Owner, will visit the site at intervals appropriate to the stage of ~~construction, or as otherwise agreed with the Owner, to become generally familiar with the~~ the Contractor's operations (1) to become familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, ~~and to determine in general if the Work observed is being performed in a manner indicating that~~ (2) to endeavor to guard the Owner against defects and deficiencies in the Work, when fully completed, will be

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in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will ~~not have control over, charge of, or responsibility~~ neither have control over, or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

**§ 4.2.3** On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

**§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION**
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

**§ 4.2.5** Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

**§ 4.2.6** The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

**§ 4.2.7** The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

**§ 4.2.8** The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

**§ 4.2.9** The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

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§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

**§4.2.15 Pre-Construction Conference.** Before starting the Work, the Engineer/Architect/Owner will schedule a conference to review the requirements on such matters as Project supervision and on-site inspection, Shop Drawing schedules and submission, progress schedules and reports, payrolls, payments to contractors, contract change orders, insurance, safety, labor provisions and equal opportunity in employment and any other items pertinent to the Project. Present at the conference will be the Engineer/Architect, Owner, Project Representative, the Contractor, and its Superintendent for the project.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

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

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, ~~as soon as practicable~~ within 15 days after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for ~~each principal portion of~~ the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the ~~14-day~~ 14 day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. ~~If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order~~

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~~shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.~~

**§ 5.2.4** The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or ~~Architect~~ Architect, upon written notice of such intent, makes reasonable objection to such substitution.

**§ 5.3 SUBCONTRACTUAL RELATIONS**

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

**§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS**

**§ 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

~~When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.~~

**§ 5.4.2** Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

~~**§ 5.4.3** Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.~~

§ 5.4.3. Intentionally Omitted.

**§5.5 SUBCONTRACTORS COORDINATION OF WORK**

Every subcontractor performing work that affects others shall provide for all requirements of the other trades, notwithstanding the Contractor's responsibility to coordinate the Work. Should the work provided by unsuitable for the application of work by any other subcontractor, the subcontractor shall notify the Contractor and the Engineer in writing immediately. The Contractor is required to forward a copy of correspondence from his subcontractors providing notice of unsuitable work.

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

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

**§ 6.1.1** The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or


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operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of ~~subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.~~ subrogation..

**§ 6.1.2** When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

**§ 6.1.3** The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

**§ 6.1.4** Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

**§ 6.2 MUTUAL RESPONSIBILITY**

**§ 6.2.1** The Contractor shall afford the Owner and separate contractors 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.

**§ 6.2.2** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

**§ 6.2.3** The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

**§ 6.2.4** The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

**§ 6.2.5** The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

**§ 6.3 OWNER'S RIGHT TO CLEAN UP**

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

**ARTICLE 7 CHANGES IN THE WORK**

**§ 7.1 GENERAL**

**§ 7.1.1** Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

**§ 7.1.2** A Change Order shall be based upon agreement ~~among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or~~ between the Owner and Contractor; a


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Construction Change Directive may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§7.1.4 Modifications shall be in compliance with the Code of the City of Norfolk, Virginia, Chapter 33.1

**§ 7.2 CHANGE ORDERS**

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

**§ 7.3 CONSTRUCTION CHANGE DIRECTIVES**

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 ~~Unit prices stated in the Contract Documents or subsequently agreed upon;~~; Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer's/Architect's recommendation to City as follows:

Engineer/Architect will review with Contractor the Engineer's/Architect's preliminary determinations on such matters before rendering a written recommendation thereon (by endorsement of an Application for Payment or otherwise). City's written decision thereon (by approval of Application for Payment or otherwise) will be final and binding (except as modified by Engineer/Architect to reflect changed factual conditions or more accurate data) upon Contractor, subject to the provisions of Paragraph 7.3.4.

~~.3~~ Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item..3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably ~~adjusted.~~adjusted provided that there is no corresponding adjustment with respect to any other item of Work.

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§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 ~~Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and~~**Overhead and Profit:** Overhead and profit costs, except where such costs have been determined by means of clause 7.3.3.2 above, wherein such costs are included in the unit prices, shall be determined as follows:

Fifteen percent (15%) of the costs determined above shall be paid for overhead and profit of the Contractor or subcontractor(s) actually performing the work, including, but not limited to, field and home office expense, superintendent, taxes, subsistence expenses of any nature, premiums on bonds, insurance, and all other costs and expenses as determined by the City.

In the event the work is performed by a subcontractor or subcontractors, the Contractor shall be paid ten percent (10%) of the total of the costs determined above, excluding the subcontractor's or subcontractors' overhead and profit, to cover and compensate the Contractor for its overhead and profit;

.5 ~~Additional costs of supervision and field office personnel directly attributable to the change.~~. Intentionally Omitted.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the ~~Architect.~~ Architect plus overhead and profit to actual net cost. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, ~~the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The~~ amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Architect will make an interim determination for purposes of monthly certification for payment for those ~~costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim~~ costs. That determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

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§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

### § 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

## ARTICLE 8 TIME

### § 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

### § 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

### § 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the ~~Owner pending mediation and arbitration;~~ Owner; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

### § 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as


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the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

## § 9.3 APPLICATIONS FOR PAYMENT

Based upon Applications for Payment submitted to the Engineer by the Contractor and certificates for payment issued by the Engineer, the City shall make monthly progress payments on account of the Contract Sum to the Contractor as provided in these General Conditions of the Contract as follows:

The City will endeavor to pay the Contractor, on or about the thirtieth calendar day after receipt of Request for Payment, ninety-five (95%) of the portion of the Contract Sum properly allocated to labor, materials and equipment incorporated in the work and ninety-five percent (95%) of the portion of the Contract Sum properly allocated to materials and equipment suitably stored at the site or at some other location agreed upon in writing by the parties, less the aggregate of previous payments in each case; provided however, the City, at any time after fifty percent (50%) of the Work has been completed, if it finds that satisfactory progress is being made, may in its sole discretion may any of the remaining partial payments in full. Also, upon Substantial Completion of the Work, the City may increase total payment to one hundred percent (100%) of the Contract sum, less such retainage as the Engineer shall determine for incomplete work and unsettled claims. But such full payment or payments shall in no manner be construed as reducing the amount of the bond or the liability of the Surety thereon, until Final Completion and acceptance of all lines of Work herein set forth. Final Payment shall be made upon completion of all work and acceptance by the Engineer in accordance with the General Conditions.

The action of the Engineer by which the Contractor is to be bound according to the terms of this Contract shall be evidenced by his final estimate and certificate, all prior estimates upon which ninety-five percent (95%) or more may be made, being merely payments on account, and not payments for accepted work, and subject to the corrections of such final estimate, which may be made without notice to the Contractor thereof, or of the measurements upon which the same is based.

**§ 9.3.1** At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application ~~shall be notarized, if required,~~ shall, certified by an officer of the firm and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

**§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, ~~or by interim determinations of the Architect,~~ , but not yet included in Change Orders.

**§ 9.3.1.2** Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

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## § 9.4 CERTIFICATES FOR PAYMENT

**§ 9.4.1** The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

**§ 9.4.2** The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

## § 9.5 DECISIONS TO WITHHOLD CERTIFICATION

**§ 9.5.1** The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; ~~or~~
- .7 repeated failure to carry out the Work in accordance with the Contract ~~Documents.~~ Documents, or
- .8 failure to comply with obligations under the Contract.

**§ 9.5.2** When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld. The City reserves the right to determine payment made.

**§ 9.5.3** If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

## § 9.6 PROGRESS PAYMENTS

**§ 9.6.1** After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.


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**§ 9.6.2** The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

~~**§ 9.6.3** The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.~~

**§ 9.6.3.** A Subcontractor inquiry for progress payment and other information shall be directed to the City Attorney's office under the Freedom of Information Act.

**§ 9.6.4** The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

**§ 9.6.5** Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

**§ 9.6.6** A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

**§ 9.6.7** Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

**§ 9.7 FAILURE OF PAYMENT**

~~If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.~~. Intentionally Omitted.

**§ 9.8 SUBSTANTIAL COMPLETION**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**§ 9.8.3** Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification


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by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and 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. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

**§ 9.9 PARTIAL OCCUPANCY OR USE**

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

**§ 9.10 FINAL COMPLETION AND FINAL PAYMENT**

**§ 9.10.1** Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. The Contractor shall submit a Contractor's release from liens, claims, security interests or encumbrances


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along with final invoice. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

**§ 9.10.4** The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

**§ 9.10.5** Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

### § 10.2 SAFETY OF PERSONS AND PROPERTY

**§ 10.2.1** The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall provide temporary fences, barricades, coverings, or other protection to preserve existing items indicated to remain and to prevent injury or damage to persons or property.

This includes providing protection of the Work, materials, appliances and fixtures against weather, rain, wind, storms, freezing or heat. At the end of the day's work, work likely to be damaged shall be properly protected. For work on existing buildings, the Contractor shall accomplish the work in such a manner that the remainder of the building, and its contents and inhabitants, are fully protected from any weather damage.

The contractor shall be responsible for ensuring that adequate measures are taken to secure materials and equipment during the progress of the Work to prevent storm-related hazards. It is, therefore, essential that the contractor take necessary precautions to ensure that openings in the building are monitored carefully. The Contractor shall take immediate actions required to seal of such openings when rain or other detrimental weather is imminent, and at the end of each workday; and ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

The provisions of this subparagraph take precedence over any similar provisions contained in the technical specifications.

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**§ 10.2.2** The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

**§ 10.2.3** The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

**§ 10.2.4** When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

**§ 10.2.7** The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

**§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY**
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

**§ 10.3 HAZARDOUS MATERIALS**
**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

**§ 10.3.2** Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the ~~Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection.~~ Owner.. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written ~~agreement of the Owner~~ direction by the City and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

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~~§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.~~

§ 10.3.3. Intentionally Omitted.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the ~~site unless such materials or substances are required by the Contract Documents.~~ site. . The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

**§ 10.4 EMERGENCIES**

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

**§ 10.4.1 Emergency Conditions.** The issuance of a Declaration of Emergency conditions by any authorized government official may result in the suspension of the Work under the Contract and/or the ordering by the City of additional work. The Contractor shall make available to the City, during the time of the declared emergency, labor and equipment for such services under the terms and conditions of the Contract. Labor and equipment rates shall not exceed FEMA reimbursable rates for the Hampton Roads area. Failure to comply with such emergency directives may result in termination of the Contract by reason of non-compliance.

## ARTICLE 11 INSURANCE AND BONDS

### § 11.1 CONTRACTOR'S LIABILITY INSURANCE

See Subparagraphs 3.18.1 and 10.3.1

**§ 11.1.1** The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;


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.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
.7 Claims for bodily injury or property damage arising out of completed operations; and
.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 ~~The insurance required by Section 11.1.1 shall be written for not less than limits of liability~~ All liability policies shall be written in an occurrence form unless otherwise specifically approved by the City.

The Contractor shall secure and maintain in force insurance, including malicious mischief and vandalism, with minimum acceptable amounts described below, naming the City as additional insured during the life of the Contract:

| | | |
|---|---|---|
| .1 | Worker's Compensation | Statutory |
| | Employer's Liability | $ 200,000 per accident injury |
| .2 | Commercial General Liability | Combined single limit $3,000,000 or |
| | | $2,000,000 per occurrence<br>$3,000,000 aggregate |
| | | $3,000,000 products & completed operations |

The Commercial General Liability Insurance required above shall include the following extensions of coverage:

(1) The coverage shall be provided under a Comprehensive form of policy or similar thereto.
(2) X.C.U. Coverage – If the Contract requires any work procedures involving blasting, excavating, tunneling or other underground work, the liability coverage shall include Standard Blasting or Explosion Coverage, Standard Collapse Coverage and Standard Underground Coverage, commonly referred to as XCU liability coverage with limits of $500,000 per occurrence and $1,000,000 aggregate.
(3) Broad Form Property Damage Endorsement.
(4) Contractual Liability coverage shall be included.
(5) Protective Liability coverage shall be included to protect the Contractor against claims arising out of operations performed by its Subcontractors.
(6) Products Liability and/or Completed Operations coverage shall be included.

| | | |
|---|---|---|
| .3 | Comprehensive Automobile Liability including owned, non-owned and hired vehicles: | |
| | Combined Single limit each accident | $2,000,000 |
| | Bodily Injury | $1,000,000 per person<br>$2,000,000 per occurrence<br>$2,000,000 aggregate |
| | Property Damage | $ 500,000 per occurrence |

.4 Environmental Impairment Liability Insurance. If applicable, as determined by the City, the Contractor shall procure and maintain during the life of the Contract Environmental Impairment Liability Insurance, which shall protect against all claims and costs including, but not limited to, bodily injury or property damage claims (including clean-up costs) caused by pollution conditions, as herein defined, arising from the contracted work. Pollution conditions means the discharge, dispersal, release or escape of smoke, vapor, soot, fumes, acids, alkalis, toxic chemicals, liquids, gases, waste materials or other irritants, contaminants, or pollutants into or upon land, the atmosphere or any watercourse or body of water, which results in bodily injury or property damage. The

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policy limits will be determined by the City and specified in the Contract Documents or ~~required by law, whichever coverage is greater. Coverages, whether written on an occurrence or~~ as prescribed by City, State or Federal law/regulations..

Coverages, written on a claims-made basis, shall be maintained without interruption from the date of commencement of the Work until at least one year following the date of final payment and ~~termination of any coverage required to be maintained after final payment, and,~~ with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

~~§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.~~

§ 11.1.3. All insurance policies required hereunder shall contain an express provision therein, or endorsement attached thereto, worded substantially as follows:

**"This is not to be cancelled or become subject to reduction of coverage prior to thirty days after the insured has received written notice mailed to the address noted hereinbefore, as evidenced by return receipt of registered letter."**

**All insurance certificates and/or policies shall designate the City of Norfolk, its employees, and its agents as "additional insured" regarding the contracted Work.**

Certificates of Insurance issued by companies licensed within the Commonwealth of Virginia shall provide the designed insurance.

Contractor shall notify the City in writing within 10 days after receiving notice of any cancellation or reduction in coverage.

§ 11.1.4 ~~The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.~~**SUBCONTRACTOR'S INSURANCE.** The Contractor shall required all subcontractors to secure and maintain in force insurance containing the same coverage and amounts as described in Subparagraph 11.1.2..

## § 11.2 OWNER'S LIABILITY INSURANCE

~~The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.~~. Intentionally Omitted.

## § 11.3 PROPERTY INSURANCE

~~§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered,~~


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~~whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.~~

~~§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.~~

~~§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.~~

~~§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.~~

~~§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.~~

~~§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.~~

§ 11.3.1. Until the Work is completed and accepted by the City, the Contractor shall purchase and maintain a Builder's Risk or property insurance as is appropriate upon the entire Work at the Site to the full insurable value thereof.

§ 11.3.1.1. Intentionally Omitted.

§ 11.3.1.2. Intentionally Omitted.

§ 11.3.1.3. Intentionally Omitted.

§ 11.3.1.4. Intentionally Omitted.

§ 11.3.1.5. Intentionally Omitted.

**§ 11.3.2 BOILER AND MACHINERY INSURANCE**

~~The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.~~. Intentionally Omitted.

**§ 11.3.3 LOSS OF USE INSURANCE**

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.


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**§ 11.3.4** If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

**§ 11.3.5** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

**§ 11.3.6** Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

**§ 11.3.7 WAIVERS OF SUBROGATION**

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

**§ 11.3.8** A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

**§ 11.3.9** If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

**§ 11.3.10** The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.


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**§ 11.4 PERFORMANCE BOND AND PAYMENT BOND**

**§ 11.4.1** The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

**§ 11.4.2** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished. A Performance Bond and Payment Bond Rider is required for all Change Orders that are in the amount of $100,000 or greater; or, if the aggregate total of multiple Change Orders is equal to or greater than $100,000.

**ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

**§ 12.1 UNCOVERING OF WORK**

**§ 12.1.1** If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its 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 at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

**§ 12.2 CORRECTION OF WORK**

**§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION**

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

**§ 12.2.2 AFTER SUBSTANTIAL COMPLETION**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

**§ 12.2.2.2** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

~~**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.~~

**§ 12.2.2.3.** Intentionally Omitted.

**§ 12.2.3** The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

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§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

### § 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

### § 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

### § 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

### § 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

### § 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until


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after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

**§ 13.5.2** If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

**§ 13.5.3** If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

**§ 13.5.4** Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

**§ 13.5.5** If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

**§ 13.5.6** Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

### § 13.6 INTEREST

~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~. Intentionally Omitted.

### § 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 TERMINATION BY THE CONTRACTOR

~~§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:~~

- ~~.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;~~
- ~~.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;~~
- ~~.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or~~
- ~~.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.~~

~~§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.~~


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~~§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.~~

~~§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.~~

§ 14.1.1:

.1 ;
.2 ;
.3 ;
.4 .

§ 14.1.2. Intentionally Omitted.

§ 14.1.3. Intentionally Omitted.

§ 14.1.4. Intentionally Omitted.

**§ 14.2 TERMINATION BY THE OWNER FOR CAUSE**

**§ 14.2.1** The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

**§ 14.2.2** When any of the above reasons exist, the Owner, ~~upon certification by the Initial Decision Maker that sufficient cause exists to justify such action,~~ , may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
.2 Accept assignment of subcontracts pursuant to Section 5.4; and
.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

**§ 14.2.3** When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

**§ 14.2.4** If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

**§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE**

**§ 14.3.1** The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.


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§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

**§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE**

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work ~~not executed.~~executed and costs incurred from this termination.

**ARTICLE 15 CLAIMS AND DISPUTES**

**§ 15.1 CLAIMS**

**§ 15.1.1 DEFINITION**

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

**§ 15.1.2 NOTICE OF CLAIMS**

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

**§ 15.1.3 CONTINUING CONTRACT PERFORMANCE**

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

**§ 15.1.4 CLAIMS FOR ADDITIONAL COST**

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

**§ 15.1.5 CLAIMS FOR ADDITIONAL TIME**

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim 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.

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**§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES**

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

**§ 15.2 INITIAL DECISION**

**§ 15.2.1** Decision of Owner. Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial ~~decision.~~ evaluation and recommendation.. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an ~~initial decision~~ final decision by the Owner shall be required as a condition precedent to ~~mediation of any Claim~~ litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the ~~Initial Decision Maker~~ Architect with no decision having been ~~rendered.~~ rendered by the Owner. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not ~~decide~~ evaluate disputes between the Contractor and persons or entities other than the Owner.

**§ 15.2.2** The ~~Initial Decision Maker~~ Architect will review Claims and within ten days of the receipt of ~~a~~ the Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) ~~reject~~ recommend rejection of the Claim in whole or in part, (3) ~~approve~~ recommend approval of the Claim, (4) ~~suggest~~ recommend a compromise, or (5) advise the parties that the ~~Initial Decision Maker~~ Architect is unable to resolve the Claim if the ~~Initial Decision Maker~~ Architect lacks sufficient information to evaluate the merits of the Claim or if the ~~Initial Decision Maker~~ Architect concludes that, in the ~~Initial Decision Maker's~~ Architect's sole discretion, it would be inappropriate for the ~~Initial Decision Maker to resolve~~ Architect to recommend resolution of the Claim.

**§ 15.2.3** In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

**§ 15.2.4** If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will ~~either reject or approve~~ recommend either rejection or approval of the Claim in whole or in part.

**§ 15.2.5** The Initial Decision Maker will ~~render an initial decision~~ recommend approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The ~~initial~~ Owner's decision shall be final and binding ~~on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.~~ subject of mediation or arbitration..

~~**§ 15.2.6** Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.~~

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~~§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~

§ 15.2.6. Intentionally Omitted.

§ 15.2.6.1. Intentionally Omitted.

**§ 15.2.7** In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

**§ 15.2.8** If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

**§ 15.3 MEDIATION**

~~§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.~~

~~§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.~~

~~§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.~~

§ 15.3.1. Intentionally Omitted.

§ 15.3.2. Intentionally Omitted.

§ 15.3.3. Intentionally Omitted.

**§ 15.4 ARBITRATION**

~~§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~

~~§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.~~


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~~§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.~~

~~§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.~~

§ 15.4.1. Intentionally Omitted.

§ 15.4.1.1. Intentionally Omitted.

§ 15.4.2. Intentionally Omitted.

§ 15.4.3. Intentionally Omitted.

§ 15.4.4 CONSOLIDATION OR JOINDER

~~§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).~~

~~§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.~~

§ 15.4.4.1. Intentionally Omitted.

§ 15.4.4.2. Intentionally Omitted.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement. Intentionally Omitted.

PART II

1. SCHEDULES AND REPORTS

Contractor shall submit for approval the following items in four (4) copies prior to commencing the Work:

a. A complete, detailed construction progress schedule in weekly increments, showing anticipated start and completion of all sections of the Work. Also, see sections 3.10 and 3.10.1

b. A complete list of Subcontractors

c. A breakdown of the Project contract price for use in processing monthly requisitions.

d. A projection of contract's monthly cash flow requirements for the duration of the Project.

e. The above requirements may be waived for small projects at the discretion of the Engineer.

2. MINORITY PARTICIPATION


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The Contractor shall notify the City in writing of the names of any minority and disadvantaged business subcontractors to be used on the Project, including the estimated dollar amount of such subcontract and the minority classification of such subcontractors. A minority and disadvantaged business is one that is at least 51% owned by an Asian American, Black, Hispanic, and American Indian, Eskimo, Aleut, or Female.

**3. EROSION & SEDIMENT CONTROL**

On construction projects that are required by the City's Erosion & Sediment Control ordinance (City Code Chapter 15) to have an approved erosion and sediment control plan, the Contractor shall be required to implement the approved plan and comply with all conditions of the plan. A copy of the approved plan and the Virginia Erosion and Sediment Control Handbook. (Third Edition, 1992) shall be kept at the City. If the Contractor determines that the approved plan can not be effectively carried out, the contractor shall be responsible for notifying the plan approving authority and requesting a plan amendment as provided for the in the Virginia Erosion and Sediment Control Law (Code of Virginia Title 10.1, Chapter 5, Article 4, Section 10.1-563C).

**4. RIGHT TO AUDIT**

For cost-reimbursement contracts, change orders issued for fixed priced contracts or other contracts in excess of $30,000, which include the provisions of services, the Contractor shall retain all books, records and other documents relative to this Contract for five (5) years after final payment or until audited by the Office of the City Auditors shall have full access to and the right to examine and duplicate any of said materials during said period.



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## SECTION 01002

## LIST OF DRAWINGS

### PART 1 - GENERAL

1.1 LIST OF CONSTRUCTION DRAWINGS

| SHEET | SHEET TITLE |
|---|---|
| GI-001 | TITLE SHEET & INDEX OF DRAWINGS |
| GI-002 | GENERAL NOTES – SHEET 1 OF 2 |
| GI-003 | GENERAL NOTES – SHEET 2 OF 2 |
| GI-004 | LEGEND & ABBREVIATIONS |
| GI-005 | EROSION & SEDIMENT CONTROL NARRATIVE |
| GI-101 | OVERALL JAMESTOWN CRESENT PLAN |
| GC-101 | WORK LIMITS & SEQUENCE OF CONSTRUCTION |
| GR-101 | SOIL BORING & TEST HOLE LOCATION PLAN |
| GR-601 | SOIL BORING LOGS |
| GR-602 | TEST HOLE REPORTS – SHEET 1 OF 2 |
| GR-603 | TEST HOLE REPORTS – SHEET 2 OF 2 |
| CE-101 | EXISTING CONDITIONS |
| CE-601 | EXISTING CONDITIONS – SURVEY REFERENCE MARK |
| CR-101 | PARCEL INFORMATION AND WORK ZONE LIMITS |
| CD-101 | DEMOLITION & EROSION CONTROL |
| CD-301 | DEMOLITION SECTIONS |
| CD-501 | EROSION CONTROL DETAILS |
| CS-101 | DEMOLITION SECTIONS |
| CS-102 | GRADING PLAN |
| CS-401 | ENLARGED SITE CIVIL PLAN |
| CS-501 | CULVERT DETAILS – SHEET 1 OF 3 |
| CS-502 | CULVERT DETAILS – SHEET 2 OF 3 |
| CS-503 | CULVERT DETAILS – SHEET 3 OF 3 |
| CS-504 | CIVIL DETAILS – SHEET 1 OF 2 |
| CS-505 | CIVIL DETAILS – SHEET 2 OF 2 |
| CU-101 | WATER MAIN PLAN & PROFILE |
| CU-501 | UTILITY DETAILS |
| CT-101 | TRAFFIC DETOUR PLAN – SHEET 1 OF 2 |
| CT-102 | TRAFFIC DETOUR PLAN – SHEET 2 OF 2 |
| CT-501 | TRAFFIC DETOUR DETAILS |

**END OF SECTION**

# SECTION 01010

# SUMMARY OF WORK

## PART 1 - GENERAL

1.1 PROJECT DESCRIPTION

The project includes the replacement of the existing concrete box culvert with a new concrete box culvert and miscellaneous site work. The existing box culvert will be demolished. The construction also includes temporary closure of Jamestown Crescent, relocation of utilities, earthwork, replacement of asphalt pavement, replacement of sidewalk, installation of a new bike lane, installation of a retaining wall and site restoration.

1.2 PROJECT LOCATION

The project is located on Jamestown Crescent between Bolling Avenue and Magnolia Avenue.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Contractor shall furnish the labor, materials, equipment and supplies to perform all Work specified and/or required to complete the project in accordance with the contract documents.

B. Contractor's Duties: Unless specifically noted, the Contractor shall provide and pay for:

1. Labor, materials, and equipment.
2. Tools, construction equipment and fuel.
3. Water and utilities required.
4. Freight, sales tax, and building permit fees.

1.4 USE OF THE PREMISES

A. All work shall be within the limits of construction shown on the plans.

B. Contractor is responsible to correct all collateral damage to existing conditions caused by his work.

C. The respective utility owners shall approve utility outages and shutdowns.

D. The Contractor shall make provisions for maintaining two way vehicular traffic at all times on Bolling Avenue, immediately adjacent to the work area.

1.5 REFERENCE SPECIFICATIONS AND STANDARDS

A. The following reference specifications and standard detail drawings (latest editions) shall be applicable to this project unless otherwise superseded by the project and specifications:

1. Virginia Department of Transportation (VDOT) Road and Bridge Specifications
2. VDOT Road and Bridge Standards
3. Manual on Uniform Traffic Control Devices Virginia Work Area Protection Manual
4. Virginia Erosion and Sediment Control Handbook (VESCH)
5. Virginia Work Area Protection Manual

B. The Contractor shall familiarize himself with the above standards and specifications, as well as these project specifications, and submit to the CE in written form any questions or proposed revisions for his interpretation or approval, respectively. Failure to comply with the standard drawings and specifications shall constitute shutdown of job and removal of unsatisfactory work at the Contractor's expense until all requirements are satisfied as directed by the CE.

1.6 PRODUCT SUBSTITUTIONS

Products specified are for establishing the type, design, and quality required. Products of equal type, design, and quality produced by other manufacturers will be considered provided the request for substitution and requisite product data is submitted to the CE for review and approval. If in the CE sole discretion an item of material or equipment proposed by the Contractor is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by the CE as an “or equal” item.

1.7 EXAMINATION OF PLANS AND SITE

The Contractor shall examine the plans and site and familiarize himself with the scope of work before submitting a bid.

1.8 AUTHORITY OF THE CONSTRUCTION ENGINEER

The Contractor shall perform all of the work specified herein to the entire satisfaction, approval, and acceptance by the City. The CE shall decide the answers to all questions relating to measurements of quantities, to the character of the work performed, and to whether the rate of progress will ensure completion within the Contract time. In addition, the CE will decide all questions as to the meaning of the specifications, and the CE shall have the authority to stop the work if necessary to provide its proper execution.

1.9 AUTHORITY AND DUTIES OF THE INSPECTOR(S)

A. Inspectors employed by the City of Norfolk (Inspector) are authorized to inspect all work performed and materials furnished. Such inspection shall extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials used. The Inspector is not authorized to alter or waive the provisions of these specifications or to make changes in the plans.

B. The Inspector is placed on the project to keep the CE informed of its progress and the manner in which it is being performed. The Inspector will endeavor to call to the attention of the Contractor any nonconformance with the plans or

specifications. The Inspector is not authorized to make a final acceptance of the work or any part of it, to approve any operation or item, to issue instructions contrary to the plans and specifications, or to act as foreman for the Contractor. The Inspector will have authority to reject defective work and materials and to suspend work that is being improperly performed.

C. Such inspection shall not relieve the Contractor of any obligation to furnish acceptable materials or to provide completed construction that is in strict accordance with the plans and specifications.

D. The Inspector will exercise such additional authority only as may from time to time be delegated by the CE, who shall also advise the Contractor in writing of such delegations of authority affecting his operations.

1.10 PERSONNEL – SUPERVISION

An experienced superintendent and necessary assistants competent to supervise the particular types of work involved shall be assigned to the project by the Contractor and shall be available at all times when work is in progress. The Contractor shall notify the CE in writing of the superintendent assigned. The superintendent shall represent the Contractor and all directions given to the superintendent shall be as binding as if given to the Contractor.

1.11 CONTRACTOR'S RESPONSIBILITY FOR WORK

A. Until final acceptance of the work by the CE, the Contractor shall be responsible for maintenance and the correction of any damages that may occur in conjunction with this work. The Contractor shall rebuild, repair, restore, and make good all discrepancies or damages to any portion of his work as determined by the CE.

B. In case of suspension of work due to inclement weather, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the work and provide for adequate drainage, without compensation. Therefore, scheduling of work shall be most important in minimizing maintenance of completed work.

**PART 2 – PRODUCTS**

NOT USED

**PART 3 – EXECUTION**

NOT USED

**END OF SECTION**

# SECTION 01015

# COORDINATION AND SPECIAL PROJECT PROCEDURES

## PART 1 - GENERAL

1.1 ENGINEER/OWNER

A. The Engineer (CE) for all work is Moffatt & Nichol. All inquiries and correspondence shall be sent to the following address:

Moffatt & Nichol
800 World Trade Center
Norfolk, VA 23510

Telephone: (757) 628-8222
Fax: (757) 628-8244

B. City of Norfolk. All inquires and correspondence related to all work shall be sent to the following address:

City of Norfolk
810 Union Street Room 700
Norfolk, VA 23510

1.2 CITY OF NORFOLK SHUTDOWNS AND TIE-IN REQUIREMENTS

A. Shutdown of existing facilities specifically described in the Contract Documents shall be coordinated by the Contractor. The Contractor shall provide written notice to the OWNER 5 days in advance of the proposed shutdown. The written notice shall also describe how the work will be conducted and for how long the shutdown will occur.

B. Shutdowns will be permitted during non-peak hours. The time of the shutdown must be approved by the City of Norfolk Utility Department and any other municipality affected by the work. Once the facility or pipeline has been cut or disconnected the contractor shall work continuously until the work is completed, tested and approved by the City of Norfolk Utility Department.

C. The Contractor shall be responsible for providing all necessary equipment, tools, labor and planning necessary to successfully complete the needed shutdown. The City will verify that all necessary efforts have been made to successfully complete the shutdown in advance of the work. If it is determined that the Contractor has not made the necessary efforts to successfully complete the shutdown, the work shall be rescheduled at no cost to the Owner.

D. The Contractor shall be responsible for providing adequate support and restraint, against system and/or test pressure, of all exposed piping prior to and during shutdown and start-up efforts.

1.3 CITY OF NORFOLK COORDINATION MEETINGS

A. City of Norfolk Water Main

1. A pre-tie-in meeting will be held prior to the day of the scheduled tie-in and a tie-in meeting will be held the day of the scheduled tie-in.

2. Attendance
   a. Owner
   b. Construction Engineer/Design Engineer
   c. Contractor
   d. Major subcontractors
   e. Representatives of governmental or other regulatory agencies

3. Minimum Agenda

   a. Review of tie-in plan of operation
   b. Review of materials, equipment, and labor to perform the work
   c. Establish emergency contacts
   d. Coordinate with local municipalities if applicable
   e. Review tie-in schedule

B. Verizon Fiber Optic Ductbank

1. During construction, the Contractor shall be responsible for coordinating all activities with Verizon for work in close vicinity of the existing fiber optic ductbank located on the south side of Jamestown Crescent. The Contractor shall provide written notice to the Verizon no less than 2-weeks prior to starting demolition within this area so proper coordination of Verizon's crews can be assigned.

2. Contractor shall be responsible for exposing fiber optic ductbank; however, once ductbank is exposed, Verizon will remove lines from ductbank and provide adequate shoring and lifting for installation of the new precast structure and associated work.

3. After the structure has been installed at this location, the Contractor shall notify Verizon so all shoring can be removed and a new ductbank can be installed around existing fiber optic lines. Once the new ductbank has been installed around the existing lines, Contractor shall complete remaining site civil items.

**PART 2 – PRODUCTS**

NOT USED

**PART 3 – EXECUTION**

NOT USED

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01019

# EXISTING UTILITIES

## PART 1 – GENERAL

1.1 EXISTING UTILITIES

A. Special precautions shall be taken by the Contractor to avoid damage to existing overhead and underground facilities owned and operated by the City of Norfolk or by public or private companies.

B. Before proceeding with the Work, the Contractor shall confer with all public or private companies, agencies or departments that own and operate utilities in the vicinity of the construction work. The Contractor shall bear the entire responsibility and cost of locating and avoiding, or repairing damage to said existing utilities.

C. Call “MISS UTILITY” (1-800-552-7001) at least 48 hours prior to commencing any excavation or ground penetration.

## PART 2 - PRODUCTS

NOT USED

## PART 3 – EXECUTION

NOT USED

**END OF SECTION**

# SECTION 01150

# FIELD ENGINEERING

## PART 1 - GENERAL

1.1. DESCRIPTION

A. Survey work may be required in the execution of the project.

B. It shall be the Contractor's responsibility to provide and pay for any and all surveying services required for the execution of the project. This work shall include, but not be limited to, field engineering; establishing lines, elevations, and levels by instrumentation or similar appropriate means; and all stakeout, both horizontal and vertical, to meet the requirements of this project.

1.2. RELATED REQUIREMENTS

A. Section 01010 - Summary of Work

B. Section 01700 - Project Closeout

C. All Division 2 Sections

1.3. QUALIFICATIONS

The Contractor shall employ a Land Surveyor registered in the State of Virginia and acceptable to Engineer.

1.4. SURVEY REFERENCE POINTS

A. Existing basic horizontal and vertical control points for the project are the existing features designated on subsequently prepared drawings.

B. The CE may conduct a pre-construction survey of existing conditions and may establish benchmarks (control) for use by the Contractor. In addition, the CE may, at its discretion, conduct additional surveys; e.g., top of finished grade, to ensure construction in accordance with subsequently prepared Plans and to measure quantities of materials.

1.5 FIELD ENGINEERING

A. The Contractor shall, immediately upon entering the project site for purposes of beginning work, locate all general reference points and take such action as is necessary to prevent their destruction, layout his work and be responsible for all lines, elevation, and measurements of all work executed by him under the contract.

B. Work of all crafts and trades shall be laid out to lines and elevations as established by the Contractor from the plans, or from instructions by the CE.

C. Unless otherwise shown, all work shall be plumb and level, in straight lines and true planes, parallel or square to the established lines and levels. The work shall be accurately measured and fitted to tolerances as established by the best practices of the crafts and trades involved, and shall be required to fit all parts of the work carefully and neatly together.

1.6 SURVEY REFERENCE POINTS

A. The Contractor shall protect control points prior to starting Work, and preserve all permanent reference points during construction and shall:

1. Make no changes or relocations.
2. Report to the CE when any referenced point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

B. Primary control points destroyed by construction operations shall be replaced by the CE at the Contractor's expense.

1.7 LINES AND GRADE

A. The Contractor shall lay out the axis of all structures and set permanent hubs marking these lines. The Contractor shall be responsible for all other lines and grades, materials and stakes for the construction of structures or reestablishment of hubs and lines.

B. Any detailed layout, including that required for establishing the grade of pipelines, shall be accomplished by the Contractor.

C. Additional temporary benchmarks required for reference shall be established by the Contractor.

D. The Contractor shall furnish all materials, stakes and grade boards that are required for layout. In addition, the Contractor shall furnish any aides required by the CE in marking the location of the various facilities on the ground, establishing bench levels and determining as-built conditions after the work is completed. The Contractor's personnel engaged in the layout work described herein and the aides furnished to the CE shall be fully capable of performing the duties set out herein and shall be fully qualified survey party chiefs and crew, as required.

E. Finished elevations for the proposed grading will be established as indicated on project drawings. The Contractor shall be responsible to establish proposed grades. The grade stakes will be provided by the Contractor.

1.8 SUBMITTALS

A. The Contractor shall submit the name and address of Surveyor before starting survey work.

B. The Contractor shall submit a certificate signed by registered surveyor or engineer certifying that the final grades are in conformance or non-conformance with the Contract Documents and subsequent plans.

C. On request, the Contractor shall submit copies of field notes.

**PART 2 - PRODUCTS**

NOT USED

**PART 3 - EXECUTION**

NOT USED

**PART 4 – MEASUREMENT AND PAYMENT**

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be included in the lump sum price.

**END OF SECTION**

# SECTION 01200

# TRANSPORTATION AND HANDLING OF MATERIALS AND EQUIPMENT

## PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall make all arrangements for transportation, delivery, and handling of equipment and material required for prosecution and completion of the Work.

B. Shipments of materials to Contractor and Subcontractors shall be delivered to the site only during regular working hours. Shipments shall be addressed and consigned to the proper party-giving name of Project, street number and City. Shipments shall not be delivered to Owner except where otherwise directed.

1.2 DELIVERY

A. Arrange delivery of products in accordance with construction schedules and in ample time to facilitate inspection prior to installation.

B. Coordinate deliveries to avoid conflict with Work and conditions at the site and to accommodate the following:

1. Work of other Contractors
2. Limitations of storage space.
3. Availability of equipment and personnel for handling products.
4. Owner's use of premises.

C. Do not have products delivered to project site until the AE has approved related Shop Drawings.

D. Have products delivered to site in manufacturer's original, unopened, label containers. Keep CE informed of delivery of all equipment to be incorporated in the Work.

E. Immediately on delivery, Contractor shall inspect shipment to assure:

1. Product complies with requirements of Contract Documents and review submittals.
2. Quantities are correct.
3. Containers and packages are intact. The labels are legible.
4. Products are properly protected and undamaged.

1.3 PRODUCT HANDLING

A. Contractor shall provide equipment and personnel necessary to handle products by methods to prevent soiling or damage. CE will not be responsible for accepting shipments of any kind. If owner offers to assist with receipt of shipments, Owner is not liable for any damage to materials.

**PART 2 – PRODUCTS**

NOT USED

**PART 3 – PAYMENT**

NOT USED

**END OF SECTION**

# SECTION 01205

# PROJECT MEETINGS

## PART 1 – GENERAL

1.1 SUBMITTALS

NOT USED

1.2 PRECONSTRUCTION CONFERENCE

A. Scheduling

After award of the construction contract and prior to the start of any construction work, the CE shall schedule and conduct a preconstruction conference. The Contractor's Project Manager, and Superintendent shall attend this meeting. The Contractor is encouraged to have an officer of his company (Project Manager could be this person) and representation from each of his sub-contractors and major construction work divisions at the conference. This conference shall be held at a location and time as specified by the CE.

B Purpose

The purpose of this preconstruction conference is to enable the CE to outline the procedures that will be followed by the City in its administration of this construction contract and to discuss the performance that will be expected from the Contractor. This conference will allow the Contractor an opportunity to ask questions about the City's supervision and inspection of contract work, about security requirements, regulations, and other similar matters. The CE may invite City personnel involved in the work to attend this conference.

C Discussion Items

The following is a sample list of items for discussion during the preconstruction conference; however, the Construction Engineer may modify this list or include additional items for discussion as conditions and the work require.

1. Authority of the Construction Engineer/Construction Engineer's Representative.

2. Contractor's Progress Schedule.
    - Schedule shall take into account all utility relocation not being completed by Contractor

3. Correspondence Procedures.

4. Contractor Labor Standards Provisions.

5. Contract Modifications and Administrative Procedures.

6. Contractor's Administrative, Laydown and Storage Areas.

7. Procedures for Processing Submittals.

8. Payment Estimate Data and Procedures.

9. Contractor Utilities.

10. Security Requirements and Other Regulations, if applicable.

11. City Furnished Equipment, if applicable.

12. Disposition of Salvage Property.

13. Contractor Insurance Requirements.

14. Value Engineering Program.

15. Contractor Performance Evaluation.

16. As-Built Drawings.

17. Warranty of Construction and Single Point of Contact.

18. Turnover of Completed Facilities.

19. Contractor Plan of Operations - The Contractor shall indicate his method(s) of layout and accomplishment of the scheduled work, and his verification/certification procedures for accuracy of the respective areas of work to be accomplished.

20. Contractor Required Notification Procedures

21. Contractor's Submittal Register

22. Contractor's Survey and Information Reporting Procedures

23. Contractor's Placement Plans and Activity Hazard Analysis Related to Placement Procedures

1.3 OTHER MEETINGS

Other meetings may be held after the Preconstruction Conference, and such meetings may include the following:

a. Contractor's Site Safety and Health Plan

b. Quality Control Plan

c. Environmental Protection Plan

1.4 MINUTES OF MEETINGS

The City shall provide the Contractor with names of all meeting attendees and a completed meeting agenda. The meeting agenda shall include all items discussed at the meeting and the City will make all corrections provided by the Contractor and resubmit the corrected minutes to the Contractor within seven days.

**PART 2 – PRODUCTS**

NOT USED

**PART 3 – EXECUTION**

NOT USED

**PART 4 – COMPENSATION**

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01210

# STORAGE OF MATERIALS

## PART 1 - GENERAL

1.1 DESCRIPTION

A. Store and protect material in accordance with manufacturer's recommendations and requirements of these Specifications. Contractor shall take appropriate measures to ensure the safety of individuals coming into contact with equipment, tools, and materials at the Work site.

B. Contractor shall make all necessary arrangements and provisions for the storage of materials. All excavated materials, construction equipment, and materials to be incorporated into the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and all public utility installations in the vicinity of the Work.

C. Contractor shall be fully responsible for loss or damage to stored materials.

D. Store materials on-site.

1.2 MAINTENANCE OF STORAGE

A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:

1. State of storage facilities is adequate to provide required conditions.
2. Required environmental conditions are maintained on continuing basis.
3. Products exposed to elements are not adversely affected.

1.3 PROTECTION AFTER INSTALLATION

A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection when no longer needed, prior to completion of Work.

B. Control traffic to prevent damage materials and surfaces.

C. Provide coverings to protect materials from damage.

## PART 2 - PRODUCTS

NOT USED

## PART 3 - EXECUTION

NOT USED

**END OF SECTION**

# SECTION 01270

# MEASUREMENT AND PAYMENT

## PART 1 – GENERAL

A. There are numerous incidental items of work that are required to complete the Project. While these items may not be specifically mentioned or illustrated by the Contract Documents and there may be no specific pay items listed for them, the Contractor will be required to perform those incidental tasks that can be anticipated through inspection of the Contract Documents, inspection of the construction area, and experience in this class of construction.

B. Items considered incidental work shall not be measured for payment or paid for as such unless specified as unit price by items on the bid form. These items and their costs shall be included in the unit prices or lump sum bid for the pay items unless bid separately. Incidental items include but are not limited to the following:

1. Allaying dust and mud
2. Daily cleanup
3. Excavation and dewatering
4. Furnishing, hauling, placing, manipulating, and compacting material
5. Locating and protecting existing utilities
6. Material royalties
7. Mobilization and demobilization
8. Offsite disposal of excavated material
9. Permits, unless provided by the Owner, inspection fees, bonds, permit fees and cost of compliance with permits including advertising if applicable
10. Removal and replacement of existing signs, fences, mail boxes, and similar existing improvements
11. Site restoration and cleanup
12. Site security
13. Storage facilities
14. Stakeout and surveying
15. Post construction surveying
16. Preconstruction video and photographs
17. Traffic Control (furnishing, installing, and removing)
18. Minor relocation of buried cables, gas lines, water lines, sewer lines, or similar utility lines 2 inches and smaller in diameter where they are shown on the plans.
19. Construction entrances
20. Pavement marking
21. Restoration of existing features to preconstruction condition or better, as required, but not limited to:
    a.) Replacement of topsoil and seeding as specified including materials, labor, soil, seed, mulch, fertilizer, watering, and maintenance of seeded areas;
    b.) Replacement of in like kind or as specified trees, shrubs, ornamentals, fencing, mailboxes, private irrigation systems
    c.) Rough and finish grading to existing or proposed conditions as required by the Contract Documents

22. Clearing and Grubbing
23. Testing, including but not limited to: Laboratory and shop tests, hydrostatic and leakage tests, soil testing, operational testing of equipment, concrete testing.
24. Temporary erosion and sediment control
25. Supervision and management
26. Labor
27. Equipment
28. Temporary facilities including but not limited to power, water, sanitary services (facilities, permits, disposal)
29. Insurance
30. Licenses
31. Workman's Compensation
32. Submittals, record keeping, record drawings
33. General overhead, applicable taxes and profits
34. Safety devices
35. Attendance at meetings as directed by the ENGINEER
36. All other items required to complete the project not specifically called for in the appropriate pay item.

The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.1 MEASUREMENT AND PAYMENT DEFINITION

A. For purposes of measurement and payment the following terms shall have the meaning assigned to each.

B. Measurement of quantities shall be made by the Contractor in the presence of the Owner or the Engineer.

C. Although not specifically enumerated in the descriptions below, the Bid Items shall include incidental items listed in Part 1.

1.2 PAYMENT ITEM BREAKDOWNS

Items for Measurement and Payment shall be as follows:

1. Mobilization/Demobilization - Payment to be made for this item is paid on a **LUMP SUM BASIS** and includes all costs associated with mobilizing and demobilizing the equipment and material for needed for the work with the culvert replacement, utility work and associated site civil items identified in the contract drawings.

2. Stormwater Line Demolition – Payment to be made for this item is paid on a **LUMP SUM BASIS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for the removal of the existing stormwater lines, removal of stormwater manhole, plugging and filling abandoned stormwater pipe in accordance with the contract documents.

3. Water Main Line Demolition - Payment to be made for this item is paid on a **LUMP SUM BASIS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for the removal of the existing lines, and plugging pipe in accordance with the contract documents.

4. Sidewalk Demolition – Payment to be made for this item is paid on a **SQUARE FOOT BASIS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for the removal of sidewalk.

5. Curb & Gutter Demolition – Payment to be made for this item is paid on a **LINEAR FOOT BASIS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for the removal of curb and gutter.

6. Asphalt Demolition - Measurement will be made on a **SQUARE YARD BASIS** and includes labor, material, equipment, hauling and disposal fees necessary for the demolition of asphalt in accordance with the plans and specifications.

7. Culvert and Miscellaneous Demolition - Payment to be made for this item is paid on a **LUMP SUM BASIS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for the removal of the culvert, wingwalls, riprap and all other miscellaneous items in accordance with the contract documents.

8. Grading – Payment to be made for this item is paid on a **LUMP SUM BASIS** and includes all costs associated with grading the Project Site including, but not limited to, fill placement and fine grading in accordance with the contract drawings and specifications.

9. Rip Rap - Measurement will be made in **TONS** and include labor, material, equipment, hauling and disposal fees necessary for the installation of rip rap in accordance with the plans and specifications. Measurement for this item, when properly installed will be based upon the **DAILY** presentation of delivery tickets to the Construction Engineer and is only associated with the Culvert work. **Without exception, delivery tickets must be given to the Inspector on a daily basis and will NOT be accepted with monthly invoices.**

10. Culvert with Wingwalls – Payment to be made for this item is paid on a **LUMP SUM BASIS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for the culvert replacement in accordance with the contract documents, including, but not necessarily limited to: construction surveying, excavation, shoring, dewatering, earthwork, bedding stone, construction of new structure (culvert, wingwalls) and wingwall penetrations.

11. 15-Inch Storm Water Pipe, Installed Complete in Place.

    Measurement will be made in **LINEAR FOOT BASIS** over the centerline of the pipe along the horizontal plane of the ground or paved surface and based on material and linear footage of pipe installed and satisfactorily tested. Pipe will be measured through fittings. The unit price shall include the following:

    1.) Dewatering
    2.) Excavation

3.) Disposal of surplus and unsuitable materials
4.) Test pits in advance of pipe laying
5.) Temporary shoring and bracing
6.) Backfilling, compacting, and compaction testing
7.) Removal of existing piping where required
8.) Pipe Bedding and Stone Backfill
9.) Tie into existing line
10.) Transition/adapter fittings for joining dissimilar pipe materials

12. Storm Water Curb Inlet

Measurement will be made based on **PER EACH BASIS** Curbinlet installed. The unit price shall include:

1.) Dewatering
2.) Excavation
3.) Disposal of surplus and unsuitable materials
4.) Backfilling, compacting, and compaction testing
5.) Removal of existing piping and manhole where required
6.) Pipe bedding and stone backfill
7.) Tie into existing line

13. Sidewalk Installation – Measurement will be made on a **SQUARE FOOT BASIS** and includes labor, material, equipment, hauling and disposal fees necessary for the installation of sidewalk in accordance with the plans and specifications.

14. Curb & Gutter Installation – Measurement will be made on a **LINEAR FOOT BASIS** and includes labor, material, equipment, hauling and disposal fees necessary for the installation of curb & gutter in accordance with the plans and specifications.

15. Aggregate Base Material (Type 21B) - Measurement will be made in **CY** and include labor, material, equipment, hauling and disposal fees necessary for the installation of aggregate base material in accordance with the plans and specifications. Quantity includes base material for full depth pavement sections and trail section.

16. Asphalt (BM-25) - Measurement will be made in **TONS** and include labor, material, equipment, hauling and disposal fees necessary for the installation of flexible asphalt in accordance with the plans and specifications.

17. Asphalt (SM-9.5) - Measurement will be made in **TONS** and include labor, material, equipment, hauling and disposal fees necessary for the installation of flexible asphalt in accordance with the plans and specifications. Quantity includes asphalt for roadway and trail section.

18. “12-Inch Water Main & Fittings”, installed complete in place.

Measurement will be made in **LINEAR FEET** over the centerline of the pipe along the horizontal plane of the ground or paved surface and based on material and linear footage of pipe installed and satisfactorily tested. Pipe will be measured through fittings. The unit price shall include the following:

1.) Dewatering
2.) Excavation
3.) Disposal of surplus and unsuitable materials
4.) Test pits in advance of pipe laying
5.) Temporary shoring and bracing
6.) Backfilling, compacting, and compaction testing
7.) Furnish and install water main and fittings
8.) Flushing and testing
9.) Water for testing
10.) Removal of existing piping where required
11.) Pipe Bedding and Stone Backfill
12.) Tie into existing line
13.) Transition/adapter fittings for joining dissimilar pipe materials
14.) Joints, elbow and etc.

19. 6-Inch Butterfly Valve

Measurement will be made based on **EACH** valve installed and satisfactorily tested.

20. Waterline Service Line with Meter, installed complete in place.

a. Measurement will be made based on **EACH** service line installed and satisfactorily tested in accordance with the plans and specifications.

21. Steel Sheet Piles – Measurement will be made in **TONS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for installation of the steel sheet piles (permanent) in accordance with the contract drawings and specifications. All temporary sheeting and shoring shall be included in line item No. 9.

22. Miscellaneous

Payment to be made for this item is paid on a **LUMP SUM BASIS** and includes labor, material, equipment, disposal fees and all appurtenances that are necessary for the remainder of the work associated with project in accordance with the contract drawings and specifications. Work shall include but not be limited to the following: traffic control, erosion and sediment control, temporary utility relocation, private and public utility coordination and over site, tree planting, earthen berm for water line, pavement markings, guardrail, site restoration and clean-up in accordance with the plans and specifications.

**PART 2 – PRODUCTS**

NOT USED

**PART 3 – EXECUTION**

NOT USED

**END OF SECTION**

# SECTION 01330

# SUBMITTAL PROCEDURES

## PART 1 GENERAL

### 1.1 SUBMITTAL IDENTIFICATION AND CLASSIFICATION

The Contractor shall insure all submittals as required in the Contract Documents are submitted to the Construction Engineer (CE), Project Manager (PM), or the Engineer (AE), as identified and in accordance with the procedures specified in this Section. Submittals may be required for work features and procedures in the specifications that are not listed or classified as indicated below. The Contractor shall still be required to list these submittals in his Submittal Register as required by the respective specification, and designate the submittal and action required in the register.

A. Submittals

Submittals required are identified by with typical items to be submitted under this classification as follows:

Required Preconstruction Submittals:

Certificates of insurance - CE
Surety bonds - CE
List of proposed subcontractors - CE
List of proposed products - CE
Construction Progress Schedule - CE
Submittal schedule - CE
Schedule of values - CE
Health and safety plan - CE
Work plan - CE
Quality control plan - CE
Environmental protection plan - CE

Shop Drawings:

As used in this section, drawings, schedules, diagrams, and other data prepared specifically for this contract, by contractor or through contractor by way of subcontractor, manufacturer, supplier, distributor, or other lower tier contractor, to illustrate portion of work – PM and AE.

Product Data: PM and AE

Closeout Submittals:

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism - CE.

As-built drawings - CE.

B. Submittal Classification

Submittals are classified as follows:

a. Construction Engineer, CE

Approval is required as designated

b. Project Manager, PM

Approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated.

1.2 APPROVAL OF SUBMITTALS

The approval of submittals shall not be construed as a complete check, but shall indicate only that the general method of construction, work scheduling, and other information are satisfactory. Approval shall not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for the dimensions, layout, and satisfactory construction of all work as indicated and specified. After submittals have been approved, resubmittal for the purpose of changing the approved Work Plan, Progress Schedule, designated Acceptance Sections, or for any other reason, shall not be given consideration unless accompanied by an explanation as to why a change is necessary. Period of review for submittal shall include at least 15 working days.

1.3 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required and promptly furnish a corrected submittal with the Daily CQC Report as specified for the initial submittal. If the Contractor considers any correction indicated on the submittal(s) to constitute a change to the contract, notice as required under the Contract Clause entitled "Changes" shall be given at the same time to the CE. Period of review for each resubmittal is the same as for the initial submittal.

1.4 WITHHOLDING OF PAYMENT

Payment for any part of the scheduled work accomplished by the Contractor, including transportation of the Contractor’s plant to or from the site of the work, will not be made if required approvals for all parts of the scheduled work have not been obtained.

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

3.1 GENERAL

The Contractor shall submit all items required and specified in these specifications, and as may be required by other portions of the scheduled work. Proposed deviations from the contract requirements shall be clearly identified. The required submittals shall be listed in the Contractor's Work Plan and on the Contractor's Submittal Register. Dimensions and units of weights and measures used on all submittals shall be the same as indicated and specified. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved as complete by the CQC representative.

## 3.2 SCHEDULING

Submittals covering component items forming a system or items that are interrelated, such as access/egress to the work area, and delivery/storage of materials prior to construction of features shall be scheduled to be coordinated with the requirements specified and submitted concurrently.

### A. Submittal and Report Identification

All submittals and reports shall be complete, properly marked, adequately detailed, and identified with location of occurrence in the respective specification section with paragraph number, drawing number and location, and respective Plan or Report requirement, as applicable. The Contractor's CQC representative shall sign and date each submittal and report as complete.

**END OF SECTION**

# SECTION 01355

# ENVIRONMENTAL PROTECTION

## PART 1 GENERAL

1.1 DESCRIPTION

This section includes Contractor requirements for environmental protection measures.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

VDOT 2007 Road and Bridge Specifications

1.3 QUALITY CONTROL

A. The Contractor shall perform monitoring, inspections, sampling and testing, reporting, and record keeping as specified.

1.4 SUBMITTALS

A. The following shall be submitted in accordance with the General Conditions of the project:

1. Storm Water Pollution Prevention Plan (SWPPP)

2. Department of Conservation and Recreation's Virginia Stormwater Management Program (VSMP) General Construction Permit DCR-01.

3. Erosion and sediment control plans and stormwater pollution prevention plans for any off site facilities that may generate a stormwater or non-stormwater discharge directly related to the construction project.

## PART 2 PRODUCTS

NOT USED

## PART 3 EXECUTION

### 3.1 ENVIRONMENTAL PROTECTION REQUIREMENTS

The contractor shall comply with all requirements of the VDOT Road and Bridge Specifications Section 107.16 – Environmental Stipulations. Where VDOT-specific forms are specified, the contractor shall substitute the equivalent City form if in existence. In all other cases, applicable portions of the VDOT forms shall be submitted unless a written waiver is granted by the Engineer.

### 3.2 INSPECTION

If the Engineer notifies the Contractor in writing of any observed noncompliance with contract requirements or Federal, State, or local laws and regulations, the Contractor shall inform the Engineer of proposed corrective action and immediately take such action to correct the noncompliance. If the Contractor fails to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action is taken. No time extensions will be granted or costs or damages allowed to the Contractor for any such suspension.

## PART 4 – COMPENSATION

### 4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01451

# QUALITY CONTROL

## PART 1 GENERAL

### 1.1 QUALITY OF WORK

A. The Contractor represents that it is fully experienced and possesses all necessary capital, facilities, and expertise to perform all of the work, and hereby guarantees that all of the work performed by it under the Contract will be of the highest quality and done in a workmanlike fashion in strict accordance with the requirements of the Contract.

B. The Contractor shall at all times employ skilled workmen and use skilled Subcontractors in the performance of the Work. When required in writing by the Owner or CE, the Contractor or its Subcontractors shall remove from the Work site any person or Subcontractor who is, in the opinion of the Owner or CE, not competent, not qualified, disorderly, or otherwise unsatisfactory and shall not again employ such discharged person or Subcontractor on the Work, except with the prior written consent of the OWNER. Discharge of any person or Subcontractor shall not be the basis of any claim for compensation or damages against the Owner or CE.

C. All Work performed under the Contract shall be of first quality workmanship throughout, with the Work complete and in full working order upon completion. Except when otherwise expressly specified in the Contract, the Contractor shall design, survey, layout, and be responsible for all methods, materials, and equipment used in performing the work.

D. If, at any time, the Contractor's work force (including Subcontractors), in the opinion of the OWNER and/or the CE, shall be inadequate for maintaining the necessary progress required to complete the Work within the Contract Time, the Contractor shall, if so required by the OWNER and/or the CE, increase the work force or equipment to such an extend as to give reasonable assurance of compliance with the Work schedule. The failure of the OWNER and/or the CE to make such demand shall not relieve the Contractor of its obligation to perform the Work in accordance with the requirements of the Contract. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of its activities, construction methods, and the rate of progress required by the Contract.

### 1.2 CONTRACTOR'S SUPERVISORY AND SITE PERSONNEL

A. The Contractor shall assign sufficient supervisory personnel to ensure the faithful prosecution of the Work and shall have adequate supervisory personnel present at the Work site who are either employees of the Contractor or duly authorized representatives designated in writing to the OWNER and/or the CE. The Contractor shall at all times maintain at the Work site a complete copy of the Contract Provisions, Contract Plans, and record drawings of the work that has been completed.

B. The Contractor shall at all times have at least one duly authorized supervisory representative at the Work site that shall be fully authorized to make binding decisions on behalf of the Contractor with respect to the Work. If the Contractor's duly authorized supervisory representative at the Work site will be absent from the Work site for more than four hours, he/she shall designate an assistant who possesses the same authority and so inform the OWNER and the resident CE, if applicable.

## PART 2 SAMPLING AND TESTING

### 2.1 GENERAL

A. All of the work under this contract shall be fully tested and inspected in accordance with the Plans and Specifications. No materials shall be placed or installed without prior acceptance by the CE, based on test and inspection results.

B. All sampling and testing necessary to secure initial approval of materials shall be the Contractor's responsibility. All subsequent sampling and testing required as the Work progresses to ensure proper and continued control of materials, will also be the responsibility of the Contractor.

C. The Contractor shall furnish all labor and materials for the sampling and testing for which the Contractor is responsible and all such costs for labor and materials shall be borne by the Contractor.

### 2.2 SUBMITTALS

A. <u>Testing Agency Qualifications:</u>
   1. Prior to start of Work; submit agency name, address, and telephone number, and names of full time and responsible officer.

   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. <u>Design Data:</u>
   Submit to OWNER for the limited purpose of assessing design conformance with information given and the design concept expressed in the contract documents.

C. <u>Test Reports:</u>
   After each test/inspection, promptly submit two copies of report to OWNER.

   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the project.
      g. Type of test/inspection.
      h. Date of test/inspection.

i. Results of test/inspection.
j. Conformance with Contract Documents.
k. When requested by OWNER, provide interpretation of results.

2. Test reports are submitted to the OWNER for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor to the OWNER, in quantities specified for Product Data.

1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

2. Certificates may be recent or previous (within one year from date of award) test results on material or product, but must be acceptable to the OWNER.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the OWNER's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports to the City.

1. Submit report in duplicate within 15 days of observation to the OWNER for information.

2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

G. Installation Drawings: Submit drawings to the OWNER.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

2. Data indicating inappropriate or unacceptable Work shall be subject to action by OWNER.

## 2.3 TESTING AND INSPECTION AGENCIES

A. The Contractor shall furnish all labor and materials for the sampling and testing for which the Contractor is responsible and all such costs for labor and materials shall be borne by the Contractor.

B. OWNER may employ and pay for services of an independent testing agency to perform specified testing and inspections.

C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

## PART 3 EXECUTION

### 3.1 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. If manufacturers' instructions conflict with the Contract Documents, the Contractor shall request clarification from the CE before proceeding with the work.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

### 3.2 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. If the manufacturers' tolerances conflict with the Contract Documents, the Contractor shall request clarification from the CE before proceeding with the work.

C. Adjust products to appropriate dimensions; position before securing products in place.

### 3.3 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. <u>Testing agency duties:</u>
   1. Test samples of mixes submitted by Contractor.

   2. Provide qualified personnel at site. Cooperate with CE and Contractor in performance of services.

3. Perform specified sampling and testing of products in accordance with specified standards.

4. Ascertain compliance of materials and mixes with requirements of Contract Documents.

5. Promptly notify CE and OWNER of observed irregularities or nonconformance of work or products.

6. Perform additional tests and inspections required by CE.

7. Attend preconstruction meetings and progress meetings.

8. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.

2. Agency may not approve or accept any portion of the Work.

3. Agency may not assume any duties of Contractor.

4. Agency has no authority to stop the work.

D. Contractor Responsibilities:

1. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.

3. Provide incidental labor and facilities:

   a. To provide access to work to be tested/inspected.

   b. To obtain and handle samples at the site or at source of products to be tested/inspected.

   c. To facilitate tests/inspections.

   d. To provide storage and curing of test samples.

4. Notify CE and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.

5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

6. Arrange with OWNER's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Retesting required because of non-conformance to specified requirements shall be performed by the same agency on instructions by OWNER. Payment for retesting will be charged to the Contractor by deducting testing charges from the contract sum.

3.4 MANUFACTURER'S FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, testing, and start-up as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to the OWNER five (5) days in advance of required observations; observer subject to the OWNER's approval.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.5 DEFECT ASSESSMENT

A. Contractor shall replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of the OWNER, it is not practical to replace the work, the OWNER will direct an appropriate remedy or adjust payment.

C. Contractor shall implement the appropriate remedy at no additional cost to the OWNER.

## PART 4 – MATERIALS AND EQUIPMENT

4.1 GENERAL

A. Materials and equipment furnished and installed shall be manufactured, fabricated or constructed to meet all applicable safety requirements. All material and· equipment supplied by the Contractor and incorporated in the Work shall be of new manufacture, free from defects and in strict compliance with the requirements of the Contract. When required by the OWNER, a certificate from the manufacturer or other responsible supplier shall be supplied attesting to this fact.

B. All tools and equipment used for construction operations shall be of the size and type suitable for the Work and shall be kept in safe and good working condition at all times.

C. The Contractor shall, whenever required during the progress of the Work and after completion of the Work, furnish proof acceptable to the OWNER that all items of equipment and all materials installed equal or exceed all requirements specified in the Contract.

D. The Contractor shall use all means possible to protect materials and equipment from damage or degradation of any kind before, during and after installation.

E. The Contractor shall replace any materials or equipment damaged during the performance of the Work to the approval of the OWNER and the CE. The cost of replacing damaged materials and equipment shall be borne by the Contractor.

## 4.2 SPECIFICATION OF PARTICULAR MATERIALS AND EQUIPMENT

A. Within the Contract, certain items are specified by brand, style, trade name, or manufacturer in order to set forth a standard of quality, and/or preference by the OWNER. Unless specifically note otherwise, it is not the intent of the Contract to exclude other processes or materials of a type and quality equal to those designated.

B. The term "or equal" as used in the Contract does not mean that the Contractor's substitution of material or equipment will necessarily be approved as equal by the CE. If the Contractor desires to substitute material or equipment on the basis that it is equal to that specified, the Contractor must submit a written request to the CE to substitute the material or equipment. The Contractor shall not use or incorporate such material or equipment into the work until the Contractor has received written approval from the CE.

C. No additional compensation or extension of time will be allowed the Contractor for any changes required to incorporate substituted materials or equipment.

## 4.3 ON-SITE STORAGE

A. The Contractor shall store all equipment and materials in a safe and suitable place in accordance with the manufacturer's recommendations. Materials and equipment shall be covered or wrapped to protect them from moisture, dust and deteriorates, as required or necessary. All on-site storage areas shall be approved in advance by the OWNER and the CE.

## 4.4 OFF-SITE STORAGE

A. The Contractor may be required to provide offsite storage of equipment and materials to enable construction to occur at the Work site. The Contractor has full responsibility to secure all offsite storage areas, if needed, and shall include the costs for providing such storage areas in the bid Proposal for the individual equipment and material items requiring off-site storage. All off-site storage areas shall be enclosed or fenced and be secure.

DEFECTIVE MATERIALS, EQUIPMENT, AND WORKMANSHIP

A. Materials, equipment, or workmanship which, in the opinion of the OWNER or the CE, does not conform to the Contract or are in any other way unsatisfactory or unsuited to the purpose for which they are intended may be rejected. The Contractor shall remove from the Work site without delay, all rejected materials, equipment and work, and shall promptly replace the same in strict conformity with the requirements of the Contract.

Unsatisfactory materials, equipment and workmanship may be rejected at any time, notwithstanding any previous testing, inspection or acceptance of such materials, equipment or workmanship, or inclusion thereof in any previously approved estimate for payment.

B. If the Contractor fails to correct defective Work, equipment or materials, the OWNER shall have the right to exercise any of the following options or any combination thereof:

1. The OWNER may replace the defective Work, materials or equipment by purchase from or contract with any other parties at the expense of the Contractor, arid in this event, the OWNER shall be entitled without compensation to the Contractor, to the use of the defective Work or equipment for such reasonable time as is necessary to enable OWNER to replace such defective work, materials or equipment.

2. The OWNER may elect to accept the defective Work, materials or equipment and issue a Change Order reflecting a credit against the contract price, computed under the terms of the Contract in an amount to be determined by the CE, which amount shall reflect the actual value to the OWNER of the accepted work.

C. Upon receipt of notice from the OWNER of any defects in material, equipment or workmanship which appear within a two-year period following the Substantial Completion Date, or within any other warranty or guarantee period required by the Contract or provided by a manufacturer or supplier, the Contractor shall promptly and with the least possible delay and inconvenience to the OWNER, repair or replace such defective workmanship, material or equipment without expense to the OWNER. Such defective workmanship or material shall be repaired or replaced to the satisfaction of the OWNER or the CE. Should the Contractor fail to act promptly, or should the circumstances require repairs or replacements to be made before the Contractor can be notified or can respond to notification; the OWNER shall have the right to make the necessary repairs or replacements at the expense of the Contractor.

D. The Contractor shall be responsible for full cost of correcting defective work and complying with warranties and guarantees as required by the Contract, including, but not limited to, transportation charges and cost of dismantling and reassembling equipment. All warranties, guarantees, and other obligations to correct work that does not comply with the Contract are material requirements of, this Contract. The performance of all warranties, guarantees and other obligations shall be secured by the performance bond and the labor and material payment bond submitted by the Contractor at the time the Contract is signed.

## PART 5 – COMPENSATION

5.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01525

# SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

## PART 1 GENERAL

### 1.1 DESCRIPTION

This section includes Contractor requirements for workplace safety.

### 1.2 REFERENCES

The publication listed below form a part of this specification to the extent referenced. The publication is referred to within the text by the basic designation only.

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

VDOT 2007 Road and Bridge Specifications

VDOT 2005 Virginia Work Area Protection Manual

CODE OF VIRGINIA

VOSH Virginia Occupational Safety and Health Standards

### 1.3 SUBMITTALS

NOT USED

## PART 2 PRODUCTS

### 2.1 CONFINED SPACE SIGNAGE

The Contractor shall provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold letters a minimum of 1 inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 5 feet.

## PART 3 EXECUTION

### 3.1 CONSTRUCTION WORK

A. The contractor shall comply with all requirements of the VDOT Road and Bridge Specifications Section 107.17 – Construction Safety and Health Standards, and Section 108.18 – Sanitary Provisions.

B. All Work under this Contract shall be performed in a safe manner. The Contractor and all subcontractors shall comply with all applicable rules, regulations, and safety standards of the Virginia Occupational Safety and Health Standards adopted under the Code of Virginia and all other federal, state, local and other governmental entities having jurisdiction over the project. The Contractor shall be solely and completely responsible for the conditions of the job site, including the safety of all persons and property during the performance of the Work. This requirement shall apply continuously and not be limited to normal working hours.

C. The Engineer's review of the Contractor's work plan, safety plan, construction sequences, schedule or performance does, not and is not intended to include review or approval of the adequacy of the Contractor's safety measures in, on, or near the job site. The Engineer does not purport to be a safety expert, and is not engaged in that capacity under this Contract. The Engineer has neither the authority nor the responsibility to enforce construction safety laws, rules, regulations, or procedures, or to order the stoppage of Work for claimed violations thereof.

D. The Contractor shall exercise all required and appropriate precautions to protect all persons and property from injury and damage.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01560

# MAINTENANCE OF TRAFFIC

## PART 1 - GENERAL

1.1 DESCRIPTION

The work shall consist of providing all materials, equipment, labor and services required to maintain and control traffic through areas of construction, maintain public and private entrances, protect the work zones from the traveling public, and protect the traveling public within the limits of the project, all in accordance with these specifications and the requirements of the MUTCD.

**In the event that lane closures are required beyond August 21, 2013, the Contractor is responsible for preparing, coordinating, and executing an approved detour and/or traffic control plan at the Contractor's expense to mitigate the extended lane closures of Jamestown Crescent.**

1.2 REFERENCE STANDARDS

A. Manual of Uniform Traffic Control Devices (MUTCD)

B. Virginia Work Area Protection Manual

## PART 2 - PRODUCTS

2.1 GENERAL

All materials used in barriers, warning devices and traffic control devices shall meet the requirements of the reference standards.

## PART 3 - EXECUTION

3.1 INSTALLATION

A. The reference standard constitutes the minimum requirements for normal conditions, and additional traffic control devices, warning devices, barriers or other safety devices will be required where unusual, complex or particularly hazardous conditions exist.

B. The required barriers and devices shall be erected by the Contractor prior to creation of any hazardous condition and in conjunction with any necessary rerouting of traffic. Trenches and holes that are left open shall be properly barricaded and delineated with flashing lighted barricades.

C. Any devices or barriers which do not apply to existing conditions shall immediately be removed, turned or covered.

D. Sufficient notice shall be given to the Owner of any scheduled operation which will affect traffic patterns or safety to permit his review of the proposed plan for installation. The contractor shall always maintain two-way traffic flow. Contact Traffic Engineer at (757) 664-7306 for lane closure permit.

E. Contractor shall assign one of his employees the responsibility of maintaining the position and condition of all barriers and devices throughout project duration. The Owner shall be kept advised as to the identification and means of contacting this employee on a 24 hour basis.

3.2 MAINTENANCE

Barriers, traffic control devices and warning devices shall be kept in correct position, properly directed, clearly visible and clean at all times. Damaged, defaced or dirty devices or barriers shall be repaired, replaced or cleaned as directed.

**PART 4 – COMPENSATION**

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01700

# PROJECT CLOSEOUT

## PART 1 - GENERAL

A. Comply with requirements stated in General Conditions of the Contract for administrative procedures in closing out the Work.

1.1 RELATED SECTIONS

1. Cleaning: Section 01710.

1.2 CONTRACTOR'S CLOSEOUT SUBMITTALS TO THE OWNER

A. Evidence of compliance with requirements of governing authorities:

1. Certificates of inspection required by authorities having jurisdiction over the work.

2. Warranties and Bonds: To requirements of governing authorities.

3. Evidence of Payment and Release of Liens: Certificate of Insurance for Products and Completed Operations.

5. Record Drawings – See Specification Section 01900

6. Final Invoice

## PART 2 - PRODUCTS

NOT USED

## PART 3 – EXECUTION

NOT USED

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01710

# CLEANING

## PART 1 – GENERAL

1.1 DESCRIPTION

A. Maintain premises free of accumulation of waste, debris, and rubbish, caused by operations.

B. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces. Leave project site clean and ready for public use.

1.2 RELATED SECTIONS:

1. Project Closeout: Section 01700.

2. Cleaning for Specific Products or Work: Specifications Section for the Work.

1.3 SAFETY REQUIREMENTS

A. Hazard Control

1. Store Volatile wastes in covered metal containers, and remove from premises daily.

2. Prevent accumulation of wastes, which create hazardous conditions.

3. Provide adequate ventilation during use of volatile or noxious substances.

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on project site.

2. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.

3. Do not dispose of wastes into streams or waterway.

## PART 2 - PRODUCTS

2.1 MATERIALS

A. Use only cleaning materials recommended by manufacturer for surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

## PART 3 - EXECUTION

3.1 DURING CONSTRUCTION

A. Execute cleaning to ensure that grounds, and public properties are maintained free from accumulations of waste materials and rubbish.

B. At reasonable intervals during the day/week the Contractor shall remove any dirt or mud which has accumulated on the asphalt roadways around the construction site.

B. Wet down dry materials and rubbish to lay fugitive dust and prevent blowing dust.

C. Provide adequate on-site containers for collection of waste materials, debris and rubbish.

D. At reasonable intervals during progress of Work, remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas.

E. Handle materials in a controlled manner with as few handlings as possible.

F. Insure that all existing drainage ditches and conduits within the Project area are kept open.

3.2 FINAL CLEANING

A. Employ experienced workmen, or professional cleaner, for final cleaning.

B. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from or on exterior finished surfaces.

C. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.

D. Broom clean paved surfaces. Rake clean other surfaces or ground.

E. Maintain cleaning until Project, or portion thereof, is accepted by the Owner.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 01900

# RECORD DOCUMENT

## PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The Contractor shall maintain and provide the Construction Engineer (CE) with project record documents as described herein.

B. Maintenance of Documents

1. Maintain on site in clean, dry, legible condition complete sets of the following: Contract Drawings, Specifications, Addenda, approved Shop Drawings, Samples, Photographs, Change Orders, other Modifications to the Contract, Field Orders, Work Change Directives, Test Records, Survey Data, Permits, and all other documents pertinent to the Contractor's work.

2. Make documents available at all times for inspection by the CE.

3. The Contractor shall demonstrate at each progress meeting or when progress payment applications are submitted that annotations have been kept current before progress payments will be authorized. Progress payments may be withheld for failure to maintain neat and accurate record documents.

C. Marking:

1. Use the following color code unless otherwise approved by the CE:

a.) Deletions: Green
b.) Additions: Red
c.) Notes and comments: Blue

D. Recording

1. Keep record documents current and updated at least weekly.

2. Do not permanently conceal any work until required information has been recorded.

3. The Contractor shall record in waterproof color ink in a neat and legible manner on one set of Contract Drawings (a clean set of prints set aside for record documents only) all deviations from the drawings at the time such deviations are made.

4. Record information shall include the following as a minimum, where applicable. Include sufficient reference and descriptions to determine exact field conditions and locations.

a. Size, horizontal and vertical location of all existing utilities uncovered during the course of the work. This shall include telephone cables and conduits, electrical cables and conduits, gas lines, water lines, sewer force mains, sanitary sewers, storm drains, and the like.

b. Horizontal and vertical location of all valves, fittings, interconnections, structures installed, at every 100-foot station the force main, and at all breaks in horizontal and vertical alignment.

c. Horizontal and vertical location of all force main taps for manual air release valves.

d. Horizontal location of lines plugged or capped.

e. Depth from rim to top of operating nut on all valves.

f. The number of turns required to fully open or close all valves. The number of turns shall be determined in the presence of the CE prior to installation.

g. Field changes of dimensions or details.

h. Changes made by Change Order, Field Order, or Work Change Directive.

i. Details not on original contract drawings.

j. Changes of different method of construction.

k. Use of different products not specified.

l. Sizes and types of material used and changes in sizes and types of materials.

m. Locations of all sleeves, bends, and other fittings used.

n. Locations of restrained joint areas.

o. Rim elevations of manholes and invert elevations of all pipes entering and exiting the manhole.

p. Size, material, depth, and location of sewer laterals including measurements taken from the nearest downstream manhole (center of manhole cover), then over perpendicular from that point on the main to the end of the lateral and depth at the end of the lateral.

q. The horizontal locations of the items listed above must be shown by giving Virginia State Plan Coordinates for every valve, fitting, and appurtenance. Swing ties to a minimum of two (2) permanent structures which are visible from the ground surface shall also be provided. Since swing tie reference points may be destroyed by future construction, it is imperative that Virginia State Plane Coordinates are carefully determined and recorded. PK nails and wooden hubs shall be set directly above each fitting to aid in post construction survey of that point and state plane coordinate determination

E. Record Drawing Accuracy:

1. Horizontal Survey Accuracy: +/- 0.1 ft
2. Vertical Survey Accuracy

a.) Force Main Elevation: +/- 0.1 ft
b.) Manhole rim and invert: +/- 0.01 ft

F. Operation and Maintenance Manuals

1. Prepare operating and maintenance instructions for each piece of operating equipment provided in simple language and with sufficient diagrams and explanation. Highlight possible hazards and caution against mistakes that might result in damage to equipment or danger to personnel.

2. Include published operating and maintenance instructions, manufacturer's detailed drawings, parts lists, warranties, pertinent literature, address and phone number of local supplier or manufacturer's representative. Data collected should provide the user with all the information required to operate, service, maintain, and make efficient use of the equipment installed or supplied.

3. Bind all files and instructions in hardback 3-ring binders, one for the entire project with labeled tabs for each piece of equipment. Supply three copies to the CE for approval and transmission to the Owner. Refer to Section 01300 – SUBMITTALS.

G. Submittal of Record Documents

1. Interim Record Drawings and Temporary Valve Guides:

    a. Interim record drawings and temporary valve guides shall be provided to the CE a minimum of one (1) week prior to a planned tie-in. No tie-ins to active systems will be allowed unless these drawings and valve guides are submitted.

2. At request for final inspection for the project, deliver record documents and final valve guides in hardcopy and electronic pdf format to the CE. Please all letter sized material in a 3-ring binder. Bind Contract Drawings and shop drawings in rolls of convenient size.

3. Furnish a transmittal letter in duplicate with the record drawing transmittal that includes the following: Date, Project Title, Contractor's Name and Address, Signature of Contractor certifying the submittal is complete and accurate.

4. Final Payment – Final payment shall be made to the Contractor as outlined in the General Conditions and only after a set of record documents has been submitted and approved by the CE and HRSD. Incomplete submission by the Contractor will require additional field surveys and possibly test-pitting

efforts. The effort needed to gather needed record data shall be included in the price of work and not paid as an additional cost by HRSD.

5. Final Payment – Final payment shall be made to the Contractor as outlined in the General Conditions and only after a set of record documents has been submitted and approved by the CE and Owner. Incomplete submission by the Contractor will require additional field surveys and possibly test-pitting efforts. The effort needed to gather needed record data shall be included in the price of work and not paid as an additional cost by the Owner.

## PART 2 - PRODUCTS

NOT USED

## PART 3 – EXECUTION

NOT USED

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02120

# EROSION AND SEDIMENT CONTROL

## PART 1 – GENERAL

1.1 DESCRIPTION

A. The work of this Section includes furnishing materials, installing, and maintaining all vegetative and structural erosion and sediment control devices.

B. Related requirements specified elsewhere.

1. Section 02220 – Site Demolition

2. Section 02200 – Earthwork

3. Section 02373 - Geotextile

C. Provide labor, materials and equipment to control erosion within the limits of construction, prevent sedimentation of off-site properties and storm drainage systems. Eliminate the tracking and flowing of mud into paved roadways.

D. The Contract Drawings show the minimum erosion and sediment control measures which are to be installed for this site. Additional measures will be implemented by the Contractor at the direction of the Owner or State Regulatory Authority to control on-site erosion and sediment from leaving the site.

1.2 REFERENCE STANDARDS

VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH)

| | |
|---|---|
| VESCH | 1995 Virginia Erosion and Sediment Control Handbook |

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

| | |
|---|---|
| VDOT | Virginia Department of Transportation Road and Bridge Specifications |

1.3 SUBMITTALS

Submit the following in accordance with the General Conditions of the Contract.

1.3.1 Shop Drawings

1.3.2 Product Data

A. Temporary Silt Fence filter cloth

B. Tree Protection Fence material

1.4 SCHEDULING

A. Erosion and sediment control measures shall be applied to the site in accordance with the sequence of construction notes indicated on the Drawings. Erosion and sediment control measures shall be disposed of within 30 days after final site stabilization is achieved or after the temporary measures are no longer needed as determined by Owner or State Regulatory Authority.

**PART 2 – PRODUCTS**

A. All materials and methods shall be in accordance with Chapter 3 of the current version of the VESCH, and the applicable sections of the VDOT.

B. Temporary Silt Fence

1. Conform to VESCH Standard and Specification 3.05.

C. Tree Protection Fence

1. 40-inch high "international orange" plastic (polyethylene) web fencing secured to conventional metal "T'or "U"posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. The fence should have the following minimum physical qualities:

Tensile yield: Average 2,000 lbs. per 4-foot width (ASTM D638)

Ultimate tensile yield: Average 2,900 lbs. per 4-foot width (ASTM D638)

Elongation at break (%): Greater than 1000% (ASTM D638)

Chemical resistance: Inert to most chemicals and acids.

D. Storm Drain Inlet Protection

1. Conform to VESCH Standard and Specification 3.07, Silt Fence Drop Inlet Protection.

**PART 3 – EXECUTION**

3.1 SILT FENCE

A. Silt fences and barrier filters shall be installed along the perimeter of the limits of the work and as indicated on the Drawings and as directed.

B. Materials and construction methods for silt fences shall conform to the details on the drawings, standards, and specifications of Section 3.05 of the VESCH. Materials and construction methods for barrier filter shall conform to the details on the drawings.

C. Additional silt fence shall be installed at locations directed by the Owner or Owner's representative, if necessary, to prevent sediment from leaving the site.

3.2 STORM DRAIN INLET PROTECTION

A. Storm drain inlet and culvert protection shall be installed at all inlets, which receive runoff from the disturbed area.

B. Materials and construction methods for inlet protection shall conform to the details on the plans, standards, and specifications of Section 3.07 of the VESCH.

C. Storm Drain Inlet Protection:

1. Silt Fence shall conform to the construction specifications for "extra strength" as provided in VESCH Section 3.05 and shall be cut from a continuous roll to avoid joints.

2. For stakes. use 2 x 4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet.

3. Space stakes evenly around the perimeter of the inlet a maximum of 3-feet avart, and securely drive them into the ground, approximately 18-inches deep (see Plate 3.07-1).

4. To provide needed stability to the installation, frame with 2 x 4-inch wood strips around the crest of the overflow area at a maximum of 1%feet above the drop inlet crest.

5. Place the bottom 12 inches of the fabric in a trench (see Plate 3.07-1) and backfill the trench with 12 inches of compacted soil.

6. Fasten fabric securely by staples or wire to the stakes and frame. Joints must be overlapped to the next stake.

3.3 TEMPORARY TREE PROTECTION FENCE

A. Construct temporary tree protection fence at the locations shown on the drawings.

B. Tree protection fence shall be installed outside of the dripline.

C. Care shall be taken when installing the tree protection fence to ensure that the tree or roots are not damaged.

3.4 STOCK PILES AND STAGING AREAS

A. All stockpiles of materials prone to erosion shall be covered. Silt fence shall be installed around the perimeter of the stockpile and staging area.

B. Stockpiles of topsoil or fill materials that will not be spread on the site within 30 days shall receive permanent seeding. Permanent seeding shall be applied within 7 days of the stockpiling of material.

3.5 TEMPORARY CONSTRUCTION ENTRANCE

A. A temporary construction entrance shall be provided as indicated on the Drawings and as directed.

B. Materials and construction methods for temporary construction entrances shall conform to the details on the drawings, standards, and specifications of Section 3.02 of the VESCH. Materials and construction methods for barrier filter shall conform to the details on the drawings and to Section 02373, Geotextiles.

3.6 MAINTENANCE OF SILT FENCES

A. Inspect immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs or replacement shall be made immediately.

B. Should the silt fence decompose or become ineffective while still necessary, the materials shall be replaced promptly.

C. Remove sediment deposits after each storm event. At no time shall sediment deposits be allowed to reach 1/2 the height of the barrier.

D. Any sediment deposits remaining in place after the devices are no longer needed, shall be dressed to conform to the existing grade, prepared and seeded.

3.7 MAINTENANCE OF INLET PROTECTION

A. Inspect immediately after each rainfall, and remove excessive sediment. Any stones dislodged shall be immediately placed back into position. Accumulations of sediment or debris shall be removed promptly.

B. Upon the end of construction, culverts, pipes, inlets, and headwalls shall be cleaned of all sediment, riprap shall be reshaped as required to conform to details, and all areas surrounding the culverts, pipes, inlets, and headwalls shall be stabilized.

3.8 MAINTENANCE OF TEMPORARY CONSTRUCTION ENTRANCES

A. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

3.9 DEWATERING

A. All water pumped during dewatering operations shall be routed through an approved sediment bag prior to discharge. At no time will the Contractor be allowed to pump directly into the creek.

3.10 REMOVED SEDIMENT

A. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

3.11 OFF-SITE CLEANUP

A. Any sediment that is transported beyond the limits of construction, into any downstream drainage system, or into on-site drainage systems shall be removed immediately.

## PART 4 – MEASUREMENT AND PAYMENT

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be included in the lump sum price.

**END OF SECTION**

# SECTION 02200

# EARTHWORK

## PART 1 – GENERAL

### 1.1 DESCRIPTION

A. Furnish all tools, equipment, labor, materials, supervision, coordination, transportation administration, incidentals, and expertise necessary for performing all earthwork complete, in strict accordance with the specifications and requirements of the Contract Documents.

B. The work in this section includes, but is not limited to:

1. The extent of excavation, backfilling, and grading covered by these Specifications relates directly to the scope of work described below and as shown on the Drawings.

2. Sheeting, shoring, bracing, and dewatering and the preparation of subgrade for structures, and pavements are included in the work of this Section.

3. Excavation for all structures and pavements.

4. Backfilling excavations.

5. Placing and compacting fill.

6. Grading to elevations shown.

7. Disposal of excess excavation material.

### 1.2 REFERENCE STANDARDS

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

| | |
|---|---|
| AASHTO T96 | Standard Specification for Resistance to Degradation of Small-Size Course Aggregates by Abrasion and Impact in the Los Angeles Machine |
| AASHTO T103 | Soundness of Aggregates by Freezing and Thawing |

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM C 14 | (1995) Concrete Sewer, Storm Drain, and Culvert Pipe |
| ASTM C 33 | (1997) Concrete Aggregates |

| | |
|---|---|
| ASTM C 76 | (1997) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe |
| ASTM D 698 | (1991) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft (600 kN-m/m)) |
| ASTM D 1556 | (1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method |
| ASTM D 1557 | (1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft (2,700 kN-m/m)) |
| ASTM D 1586 | (1984; R 1992) Penetration Test and Split-Barrel Sampling of Soils |
| ASTM D 2487 | (1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System) |
| ASTM D 2922 | (1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) |
| ASTM D 3017 | (1996) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) |
| ASTM D 4253 | (1993) Maximum Index Density of Soils Using a Vibratory Table |
| ASTM D 4254 | (1991) Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density |

CORPS OF ENGINEERS (COE)

| | |
|---|---|
| COE EM-385-1-1 | (1996) Safety and Health Requirements Manual |

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

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| VDOT | 2007 Virginia Department of Transportation Road and Bridge Specifications |

1.3 QUALITY ASSURANCE

A. Perform earthwork in compliance with the applicable requirements of the VDOT Road and Bridge Specifications, 2007, and other criteria specified herein.

1.4 DEFINITIONS

A. Backfill: Material used in refilling a cut, trench or other excavation.

B. Cohesive Materials: Soils classified by ASTM D 2487 as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesive only when fines have a plasticity index greater than zero.

C. Cohesionless Materials: Soils classified by ASTM D 2487 as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero.

D. Compaction: The process of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of Compaction" is expressed as a percentage of the maximum density obtained by the test procedure described in ASTM D 698 or ASTM D 1557 for general soil types or ASTM D 4253 or ASTM D 4254 (Relative Density) for isolated cohesionless materials, abbreviated in this specification as "_____ percent ASTM D _____ maximum density."

E. Fill: Specified material placed at a specified degree of compaction to obtain an indicated grade or elevation.

F. Hard Material: Weathered rock, dense consolidated deposits, or conglomerate materials (excluding man made materials such as concrete) which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal. Material indicated in the soil boring logs as having a standard penetration resistance as determined by ASTM D 1586 between 60 and 600 blows per foot is arbitrarily defined herein as "Hard Material."

G. In-Situ Soil: Existing in place soil.

H. Lift: A layer (or course) of soil placed on top of subgrade or a previously prepared or placed soil in a fill or backfill.

I. Refill: Material placed in excavation to correct overcut in depth.

J. Rock: Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 0.5-cubic-yard in volume. Removal of "hard material" will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

K. Subgrade: The material in excavation and fills immediately below any subbase, base, pavement or other improvement. Also as a secondary definition, the level below which work is referenced.

L Topsoil: In natural or undisturbed soil formations, the fine-grained, weathered material on the surface or directly below any loose or partially decomposed organic matter. Topsoil may be a dark-colored, fine, silty, or sandy material with a high content of well-decomposed organic matter, often containing traces of the parent rock material. Gradation and material requirements specified herein apply to all topsoil references in this contract. The material shall be representative of productive soils in the vicinity.

M. Unyielding Material: Rock rib, ridge, rock protrusion, or soil with cobbles in the trench bottom requiring a covering of finer grain material or special bedding to avoid bridging in the pipe or conduit.

N. Unsatisfactory Material: In-Situ soil or other material which can be identified as having insufficient strength characteristics or stability to carry intended loads in the trench without excessive consolidation or loss of stability. Also backfill material which contains refuse, frozen material, large rocks, debris, soluble particles, and other material which could damage the pipe or cause the backfill not to compact. Materials classified as PT, OH, or OL by ASTM D 2487 are unsatisfactory.

O. Unstable Material: Material in the trench bottom which lacks firmness to maintain alignment and prevent joints from separating in the pipe, conduit, or appurtenance structure during backfilling. This may be material otherwise identified as satisfactory which has been disturbed or saturated.

1.5 SUBMITTALS

A. Submit the following in accordance with Section 01330.

1. Test Reports

a. Aggregate base material tests

b. Fill material tests

c. Select material tests

d. Subgrade material tests

e. Topsoil tests

f. Density and moisture tests

2. Certificates

a. Shoring and sheeting plan

b. Dewatering plan

1.6 REGULATORY REQUIREMENTS

A. Materials and workmanship specified herein with reference to VDOT shall be in accordance with the referenced articles, sections, and paragraphs of the standard except that contractual and payment provisions do not apply. Where the term "Engineer" is used, it shall mean the CE. Where the term "state" is used, it shall mean Owner.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store materials in a manner to prevent contamination, segregation, freezing, and other damage.

1.8 CRITERIA FOR BIDDING

A. Base bids on the following criteria:

1. Ground water elevations indicated are those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.

2. Borrow material, suitable backfill and bedding material in the quantities required is not available at the project site.

3. Blasting will not be permitted.

1.9 PROTECTION

A. Dewatering Plan: Base on site surface and subsurface conditions, available soil and hydrological data.

B. Utilities: Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Perform work adjacent to utilities as indicated in accordance with procedures outlined by utility company. Excavation made with power-driven equipment is not permitted within two feet of known utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation. Report damage to utility lines or subsurface construction immediately to the CE.

1.10 QUALITY ASSURANCE

A. Shoring and Sheeting Plan: Describe materials of shoring system to be used. Indicate whether or not components will remain after filling or backfilling. Provide plans, sketches, or details along with calculations by a professional engineer registered in Virginia. Indicate sequence and method of installation and removal.

B. Dewatering Plan: Describe methods for removing collected water from open trenches and diverting surface water or piped flow away from work area. Describe equipment and procedures for installing and operating the dewatering system indicated. Record performance and effectiveness of method or system in use and submit weekly. Dewatering plan, as a minimum, shall address those requirements outlined in paragraph entitled "Drainage and Dewatering."

C. Density and moisture tests: Submit field test data sufficiently in advance of construction so as not to delay work. Submit within 14 days of test date.

1.11 PROTECTION OF PERSON AND PROPERTY

A. Barricade open excavations for safety of persons and vehicles. Protect adjacent structures and other facilities from damage caused by settlement, lateral movement, undermining, washouts, and other hazards.

## PART 2 – PRODUCTS

2.1 SOIL MATERIALS

A. Provide soil materials as specified below free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, ice, or other deleterious and objectionable materials.

1. Aggregate Base Material: Clean crushed stone or gravel conforming to the requirements of Section 208 of VDOT Specification for Type I, size No. 21B as modified herein:

a. Slag, recycled concrete, or recycled asphalt pavement shall not be used.

b. Crushed aggregate retained on a No. 4 sieve shall have at least 90 percent by weight with at least 2 fractured faces and 100 percent by weight with at least 1 fractured face. The area of each face shall be equal to at least 75 percent of the smallest mid-sectional area of the piece. When 2 fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 to count as 2 fractured faces.

c. Soundness loss shall not exceed 13 percent, after 5 cycles, when tested in accordance with AASHTO T 103.

d. Abrasion loss shall not be more than 40 percent, after 500 revolutions when tested in accordance with the requirements of AASHTO T 96.

2. Select Material: Select material shall conform to the requirements of Section 207 of VDOT for Type I with a minimum CBR equal to 20 as modified herein. Slag, recycled concrete, or recycled asphalt pavement shall not be used. Recycled aggregate base material may be used provided the materials meet the compaction and CBR requirements.

## PART 3 – EXECUTION

3.1 GENERAL

A. Excavation, grading, and fill construction shall conform to the OSHA Standard Specification.

B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

C. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

D. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

E. Ground surfaces after completion of Unclassified Excavation shall conform to the lines and grades shown on the Contract Drawing to within 0.1-foot.

F. Excavation of unsuitable material below proposed subgrade elevations shall only be performed as directed by the Engineer; the Administration shall be responsible for maintaining records of such work.

3.2 DEWATERING

A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding the project site and surrounding area.

B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

C. The Contractor shall remove, from the start of excavation until completion of backfilling, all water from excavations. All ground water, including water from such sources as springs, seepage, leakage, perched water, and all surface water from such sources as rain, snow, runoff, streets, gutters, hydrants, accidental spillage, and all liquid mud, from whatever source shall be removed. Water and its removal shall be considered unclassified excavation and incidental to the earthwork operation for which it is performed, fully the responsibility of the Contractor, without cost to the Administration. The Contractor shall anticipate in the bid a significant dewatering effort since all groundwater will be subject to tidal influence.

D. The responsibility for the performance of dewatering methods and devices is entirely with the Contractor. The correction of settlement and damage to persons and property due to settlement shall be the responsibility of the Contractor.

E. All water, mud, etc., removed from excavations shall be directed to an approved sediment control device. No direct pumping of water to inlets will be permitted.

3.3 EXCAVATION

A. Explosives: Explosives are not permitted.

B. Sheeting and Shoring: Sheeting and shoring shall be considered unclassified excavation and incidental to any earthwork operation.

1. Due to the nature of the soil material, groundwater and proximity of existing structures all excavation under this contract shall be sheeted and braced.

2. The Contractor shall support the sides and ends of all excavations with braces, trench boxes, sheeting shores or stringers which meet accepted engineering requirements. All sheeting shall be put in place and/or driven by persons skilled in such work and shall be so arranged that it may be withdrawn as backfilling

proceeds, without injury to the structures built under the contract or to any roadbed, adjacent structure or property. If, in the opinion of the Engineer, the material furnished for sheeting excavation is not of proper quality or sufficient size, or not properly placed to ensure the safety of the work or of adjacent structures or property, the Contractor shall, upon notice, forthwith procure and place suitable shoring materials or the work may be ordered stopped until said notice shall have been carried out and without entitling the Contractor to any claim for extra compensation, damage or delay. Nothing in this specification shall be read or interpreted as permitting lesser degrees of support than required by Federal regulations under OSHA. At all times, Federal requirements shall be met as a minimum.

3. If the Contractor requests to leave the sheeting in place and approved by the Engineer, it shall be cut-off at least 18 inches below the finished grade. All cut-off material shall be removed. The sheeting left in place and the cut off and removal shall be at the Contractor's own expense.

4. Wherever necessary, in quicksand or soft ground, or for the protection of any property, sheeting shall be driven to such depth below the bottom of the trench as may be required or directed without extra compensation.

5. In all trench operations sufficient light, either natural or artificial, shall be provided when in use.

6. All trenches 4 feet or more in depth shall, at all times, be supplied with at least one (1) ladder for each 100 feet in length or fraction thereof. The ladder shall extend from the bottom of the trench to at least 3 feet above the surface of the ground and shall support a minimum weight of 300 pounds per step.

7. Red lanterns, electrical blinkers, torches, or other approved lighting shall be placed along the exposed sides of all trenches at night, as required, for necessary warning to the public. In no case shall the lights be placed further than 20-feet apart.

8. Guardrail or barricades shall be provided at or near the sides of trenches and excavations as necessary to protect the workmen and the public. The description of the type of guardrail or barricades to be used shall be submitted to and approved by the Engineer prior to starting any work.

9. Trench excavations shall be shored, sheeted and braced. All shoring and bracing shall be constructed in accordance with the design approved by the Engineer.

10. A trench box may be used for utility excavation, when possible, in lieu of conventional sheeting and shoring.

11. Excavated material and superimposed loads shall not be nearer than 18 inches to the sides of a trench or other excavation, unless bracing has been installed that is designed to withstand the load.

C. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered. Unclassified excavation shall be confined to the excavation, backfill, compaction, hauling, and disposal for pavements on fast land. Excavation for demolition and removal work, as well as installation of utilities shall be considered incidental to that work.

D. The Contractor shall exercise care in his excavation operations so as not to damage existing structures.

E. Pavement materials, concrete foundations, wood, trash, debris, and unsuitable soils encountered shall be disposed of offsite in a legal manner.

3.4 EXCAVATION FOR UTILITY TRENCHES AND STRUCTURES

A. Excavate to indicated depth and width of the proposed pipe trench. Where tight sheeting is necessary or ordered by the Engineer, the maximum allowable width of excavation from inside face of sheeting shall be increased three (3) inches. Trenching shall be in accordance with the latest edition of “Subpart P – Excavation, Trenching and Shoring” of the OSHA Standards and Interpretations. Take care not to overexcavate.

B. The sides of the trenches shall be practically plumb. Under no circumstances will they be permitted to be sloped except with the approval of the Engineer and then only for portions of the trench two or more feet above the top of pipe or utility.

C. Bottom of trenches shall be accurately graded and bedding installed to provide uniform bearing and support for each section of pipe on specified pipe bedding at every point along its entire length, except for portions of pipe sections where it is necessary to excavate for bell holes and for proper sealing of pipe joints. Bell holes and depressions for joints shall be excavated after trench bottom has been graded and pipe bedding has been placed, and, in order that pipe rest on prepared bottom for as nearly its full length as practicable, bell holes and depressions shall be only of such length, depth and width as required for properly making the particular type of joint. Stones shall be removed as necessary to avoid point bearing.

D. Excavation of all utility trenches shall be fully completed at least 20-feet in advance of pipe laying, unless otherwise authorized.

E. Excavations for structures shall not normally exceed the size of the structure plus 12-inches per side.

F. Nothing in these specifications shall be interpreted to relieve the Contractor of any requirements of law or applicable regulation governing trenching.

3.5 MISCELLANEOUS EXCAVATION

A. The Contractor shall do miscellaneous excavating work as may be necessary or directed by the Engineer. Miscellaneous excavation shall be subject to the same conditions and requirements as specified for trench excavation.

B. Miscellaneous excavation shall include digging extra trench widths made necessary by changes in location after the original trench had been excavated or excavation for any special structures outside the trench not shown on the drawings or described in the Specifications. Test pits may be dug in advance by the Contractor for the purpose of satisfying himself as to the location of underground obstructions or conditions and shall be considered miscellaneous excavation. Only test pits approved by the Engineer shall be considered for payment.

3.5 PROTECTION

A. Shoring and Sheeting: Provide shoring and sheeting where required for construction. In addition to Section 25 A and B of COE EM-385-1-1 and other requirements set forth in this contract, include provisions in the shoring and sheeting plan that will accomplish the following.

1. Prevent undermining of pavements, foundations and slabs.

2. Prevent slippage or movement in banks or slopes adjacent to the excavation.

B. Dewatering: Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in-situ material. While the excavation is open, the water level shall be maintained continuously, at least 1 feet below the working level.

1. Operate the dewatering system until construction work below existing water levels is complete. Measure and record the performance of the dewatering system. Have a back-up pump and system available for immediate use.

C. Underground Utilities: Location of the existing utilities indicated is approximate. The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall scan the construction site with electromagnetic and sonic equipment and mark the surface of the ground where existing underground utilities are discovered.

D. Structures and Surfaces: Protect newly backfilled areas and adjacent structures, slopes, or grades from traffic, erosion settlement, or any other damage. Repair and reestablish damaged or eroded grades and slopes and restore surface construction prior to acceptance. Protect existing bodies of water and storm drain inlets from water-borne soil by means of filter fabric dams or sacks as indicated on the contract drawings.

1. Disposal of Excavated Material: Dispose of excavated material so that it will not obstruct the flow of runoff, streams, endanger a partly finished

structure, impair the efficiency or appearance of any facilities, or be detrimental to the completed work.

3.6 SURFACE PREPARATION

A. Cutting Pavement, Curbs, and Gutters: Saw-cut with neat, parallel, straight lines 1-foot wider than trench width on each side of trenches and 1-foot beyond each edge of pits.

3.7 BACKFILLING

A. Construct backfill in two operations (initial and final) as indicated and specified in this section. Place initial backfill in 6-inch maximum loose lifts to 1-foot above pipe or duct unless otherwise specified. Ensure that initially placed material is tamped firmly under pipe haunches. Bring up evenly on each side and along the full length of the pipe or duct structure. Ensure that no damage is done to the utility or its protective coating. Place the remainder of the backfill (final backfill) in 9-inch maximum loose lifts unless otherwise specified. Compact each loose lift as specified in the paragraph entitled "General Compaction" before placing the next lift. Do not backfill in freezing weather or where the material in the trench is already frozen or is muddy, except as authorized. Provide a minimum cover from final grade of 3 feet for water piping and 2 feet for sewer mains. Where settlements greater than the tolerance allowed herein for grading occur in trenches and pits due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation. Coordinate backfilling with testing of utilities. Testing for the following shall be complete before final backfilling: water distribution, storm drainage and sanitary sewer systems. Provide buried warning and identification tape installed in accordance with the manufacturer's recommendation.

3.8 COMPACTION

A. Use hand-operated, plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors. Avoid damaging pipes and protective pipe coatings. Compact material in accordance with the following unless otherwise specified. If necessary, alter, change, or modify selected equipment or compaction methods to meet specified compaction requirements.

1. Compaction of Material in Sub-cuts or Over-excavations: Compact to 95 percent of ASTM D 1557 maximum density. In soft, weak, or wet soils, tamp refill material to consolidate to density of adjacent material in trench wall.

2. Compaction of Pipe and Conduit Bedding: In soil, compact to 90 percent of ASTM D 1557 maximum density.

3. Compaction of Backfill: Compact initial backfill material surrounding pipes, cables, conduits, or ducts, to 95 percent of ASTM D 1557 maximum density except where bedding and backfill are the same material. Where bedding and backfill are the same material, compact initial backfill to the density of the bedding. For utilities under structures and pavements,

compact succeeding layers of final backfill as specified under Section 02200 Paragraph 3.7.

4. Compaction of Pavement Subgrade: Compact to 95 percent of ASTM D 1557 maximum density.

5. Compaction of Select Material and Fill for Pavements: Compact to 95 percent of ASTM D 1557 maximum density.

6. Compaction of Aggregate Base Course: Compact to 100 percent of ASTM D 1557 maximum density.

3.9 SPECIAL EARTHWORK INSTALLATION REQUIREMENTS

A. Manholes and Other Appurtenances: Provide at least 12 inches clear from outer surfaces to the embankment or shoring. Remove unstable soil that is incapable of supporting the structure to an over-depth of two feet and refill with gravel to the proper elevation. Stabilize soft, weak, or wet excavations as indicated. Refill over-depths with gravel to the required grade and compact as specified.

B. Compaction for Structures: Place final backfill in 6-inch maximum loose lifts. If a vibratory roller is used for compaction of final backfill, the lift thickness can be increased to 9 inches. Compact all backfill surrounding pipes, ducts, conduits, and other structures to 95 percent of ASTM D 1557 maximum density. Backfill to permit the rolling and compacting of the completed excavation with the adjoining material, providing the specified density necessary to enable paving of the area immediately after backfilling has been completed. Compaction requirements for materials in pavement sections above the subgrade level shall be as specified for pavement utilities.

3.10 FINISH OPERATIONS

A. Grading: Finish to grades indicated within 0.10 feet. Grade areas to drain water away from structures.

B. Protection of Surfaces: Protect newly graded areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

C. Pavement Repair: Repair pavement.

3.11 FIELD QUALITY CONTROL

A. Test sand, gravel, bedding, backfill for conformance to specified requirements. Test backfill to be used under roads and paved areas for conformance to special requirements. Test bedding and backfill for moisture-density relations in accordance with ASTM D 1557 as specified herein. Perform at least one of each of the required tests for each material provided. Perform sufficiently in advance of construction so as not to delay work. Provide additional tests as specified above for each change of source. Perform density and moisture tests in randomly

selected locations and in accordance with ASTM D 1556 or ASTM D 2922 as follows.

1. Pavement Subgrade: One test per lift per 1,000 square yards.

2. Fills for Pavement: One test per lift per 1,000 square yards.

3. Aggregate Base Course: One test per lift per 1,000 square yards.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02220

# STRUCTURAL DEMOLITION

## PART 1 – GENERAL

### 1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

| | |
|---|---|
| ANSI A10.6 | (1990; R 1998) Safety Requirements for Demolition Operations |

U.S. ARMY CORPS OF ENGINEERS (USACE)

| | |
|---|---|
| EM 385-1-1 | (1996) Safety and Health Requirements Manual |

### 1.2 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Construction Engineer (CE). The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from the project site daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the CE. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

### 1.3 REGULATORY AND SAFETY REQUIREMENTS

Comply with federal, state, and local hauling and disposal regulations. Safety requirements shall conform to ANSI A10.6.

### 1.4 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris to adjacent structures and buildings and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.

### 1.5 PROTECTION

#### 1.5.1 Existing Work

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or

to remain the property of the City of Norfolk; any damaged items shall be repaired or replaced as approved by the CE. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal work. Repairs, reinforcement, or structural replacement must have the CE's approval.

1.5.2 Facilities

Where removal of existing utilities is specified or indicated, provide approved barricades and temporary covering of exposed areas. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.3 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of structural elements will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.6 BURNING

Burning at the project site for the disposal of refuse and debris will not be permitted.

1.7 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by the CE.

1.8 USE OF EXPLOSIVES

Use of explosives will not be permitted.

**PART 2 – PRODUCTS**

NOT USED

**PART 3 – EXECUTION**

3.1 EXISTING FACILITIES TO BE REMOVED

3.1.1 Structures

Existing structures indicated on the drawings to be removed and replaced shall be removed in their entirety or as indicated on drawings.

3.1.2 Utilities and Related Equipment

Remove existing utilities, as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the CE. When utility lines are encountered that are not indicated on the drawings, the CE shall be notified prior to further work in that area.

3.2 DISPOSITION OF MATERIAL

3.2.1 Title to Materials

Except where specified in other sections, all materials and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from the Owner's property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon authorization by the CE to begin demolition. The City of Norfolk will not be responsible for the condition or loss of, or damage to, such property after contract award. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

3.2.2 Reuse of Materials and Equipment

Remove and store materials and equipment indicated to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.3 CLEANUP

Debris and rubbish shall be removed completely from the project site. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

**PART 4 – COMPENSATION**

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02275

# RIPRAP

## PART 1 – GENERAL

1.1 DESCRIPTION

A. This section includes requirements for placing riprap and filter fabric at the locations designated on the plans.

B. Related work specified elsewhere.

1. Section 01330 – Submittal Procedures

2. Section 02373 – Geotextiles

1.2 REFERENCE STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

VDOT 2007 Road and Bridge Specifications

## PART 2 – PRODUCTS

2.1 MATERIALS

A. Filter Fabric: shall be in accordance with VDOT specification section 245 for "Geotextile for Use as Riprap Bedding Material" and with Section 02373 "Geotextiles".

B. Stone: Sound, dense, durable quarry or field stone free of cracks or iron pyrite intrusions, without other structural defects and of such quality that they will not disintegrate on exposure to water or weathering. Use stone suitable in all respects for the purpose intended. Stone shall be VDOT Class 1A Riprap and shall adhere to VDOT Section 414.

## PART 3 – EXECUTION

3.1 INSPECTION

A. Inspect slopes or ground surface on which rip-rap is to be placed. Trim the area to the lines and grades indicated on the Drawings or as directed by the Owner/Engineer. Properly compact any earth depressions filled while trimming slopes.

3.2 PLACEMENT

A. Place filter fabric in loosely laid condition so that it will conform to the irregularities when riprap is placed.

B. Lap adjoining sheets in accordance with the manufacturer's instructions, but not less than 1.0 ft.

C. Lap adjoining sheets in accordance with the manufacturer's instructions, but not less than 1.0 ft.

D. Stake fabric down in the correct locations as required to stop movement prior to stone placement.

E. Handle or dump rip-rap into place so as to produce a compact, well-graded mass with a minimum percentage of voids.

F. Place riprap to its full course thickness, measured perpendicular to the slope, in one operation and in such a manner that the slopes will be disturbed as little as possible.

G. Rearrange the individual riprap pieces, as required, by mechanical equipment or by hand, to the extent necessary to obtain a reasonably well-graded distribution of sizes as specified.

H. The surface of the completed riprap shall be uniform in appearance, free from humps or depressions.

3.3 INSPECTION AND MAINTENANCE

A. Riprap and filter fabric shall be inspected for dislocation or failure. Conduct regular inspections during the course of construction.

B. In the event that the fabric is displaced or damaged during riprap placement, remove the riprap and reposition or replace the fabric prior to replacing the riprap.

**PART 4 – COMPENSATION**

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02373

# GEOTEXTILE FABRIC

## PART 1 – GENERAL

1.1 SUMMARY

The work to be performed under this Section shall consist of furnishing labor, materials, equipment, and services necessary for installing geotextile fabric as specified in this Section and as indicated on the Contract Drawings.

1.2 REFERENCES

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

VDOT 2007 Road and Bridge Specifications

1.3 QUALITY CONTROL

A. The Engineer reserves the right to review the materials used in construction. No material shall be used in the work if after review the material has in any way become unfit for use. Review of the material by the Engineer shall be required prior to site delivery of the geotextile fabric material.

1.4 SUBMITTALS

A. The Contractor shall furnish the Engineer with the manufacturer's certification that the requirements for materials, manufacture, and tolerances, as stated in this Specification, have been met.

## PART 2 – PRODUCTS

2.1 MATERIALS

A. Each application of geotextile fabric shall conform to the requirements defined in VDOT Road and Bridge Specifications Section 245 - Geosythetics for its particular use.

## PART 3 – EXECUTION

3.1 INSTALLATION

A. The fabric shall be placed over the prepared surface at the locations as shown on the Drawings and areas directed by the Engineer after clearing

and grubbing and subgrade compaction are complete. The fabric shall be placed directly on the existing ground after the removal of all objects and debris which might cause the fabric to be punctured or damaged and after the removal of all vegetation. The geotextile fabric is intended to prevent pumping of soft in-situ clay material into the granular subbase material.

B. The fabric shall be placed in a relatively smooth condition to prevent tearing or puncturing of the fabric and shall be laid loosely but without wrinkles or creases so that placement of the fill will not stretch or tear it. Slack shall be left in the fabric around irregularities to allow settlement of the embankment material to take place without damaging the fabric.

C. The fabric shall be placed so that the preceding roll overlaps the following roll in the direction the fill material is being spread. All adjacent rolls of fabric will be overlapped a minimum of three feet, or have a sewn joint with a 6-inch overlap, including the ends of the rolls. The top layer of fabric will in all cases be parallel to or in the direction of the fill placement.

D. The geotextile shall be covered with the fill material as soon as possible after its placement. During all periods of shipment and storage, the fabric shall be protected from direct sunlight, ultra-violet rays, temperature greater than 140 degrees F, mud, dirt, dust, and debris. To the extent possible, the fabric shall be maintained wrapped in a heavy-duty protective covering.

E. The Contractor shall take all necessary precautions to protect the fabric from damage. Damage to the fabric resulting from any cause whatsoever shall either be repaired to the Engineer's satisfaction or the damaged fabric replaced at no additional expense.

F. All tears in the geotextile fabric shall be patched by placing an additional section of fabric over the tear with a minimum 3-foot overlap.

G. No construction equipment shall be permitted to travel directly on the geotextile fabric. Geotextile fabric shall be protected from exposure to sunlight during transportation to and storage at the site. All fabric shall be covered with fill within 1 week after placement.

H. At no time should equipment be allowed on the fabric with less than 8 inches of compacted fill over the fabric.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02464

# STEEL SHEET PILING

## PART 1 – GENERAL

1.1 DESCRIPTION

Work covered by this Section includes the furnishing of all materials and equipment and the performing of all labor necessary to construct steel sheet pile bulkhead as shown on the Contract Drawings and as herein specified or directed by the Engineer.

1.2 RELATED SECTIONS

A. Section 03300 Cast-In-Place Concrete

B. Section 09970 Coating of Steel Sheet Pile Structures

1.3 REFERENCES

A. Appendix I Boring Logs – Appendix A

B. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

C. Unless otherwise indicated the most recent edition of the publication, including any revisions, shall be used.

D. American Society for Testing and Materials (ASTM)

| | |
|---|---|
| ASTM A 6 | (2006) General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling |
| ASTM A 325 | (2006) Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength |
| ASTM A 572 | (2006) High-Strength Low-Alloy Columbium-Vanadium Structural Steel |

E. American Welding Society, Inc. (AWS)

AWS D1.1 (2006) Structural Welding Code – Structural Steel

1.4 SUBMITTALS

A. Submit the following in accordance with the Section 01330 “Submittals” of these Specifications.

B. Certifications, test procedures, and other submittals shall show the appropriate ASTM test(s) for each material.

C. Statement of Contractor qualifications.

D. Submit manufacturer's certified test reports, for each heat, indicating that materials have been tested and certified to meet the specified chemical, mechanical, and section properties prior to delivery at the site. Certifications shall be submitted for all materials, including but not limited to:

1. Steel sheet piling.
2. Structural steel shapes and plates for fabrications.

E. Welding procedures, qualifications, and testing shall be submitted in conformance with the requirements of Section 05500, "Metal Fabrications."

F. Layout Drawings: Submit drawings for approval prior to start of work or ordering materials. Drawings for sheet piling shall include complete dimensions, minimum section properties, fabricated sections, and an overall layout. Include details of top protection, special reinforcing tips, tip protection, lagging, splices, fabricated additions to plain piles, and corrosion protection.

G. Work Plans

1. The Contractor shall submit to the Engineer details of equipment, materials, methods, and procedures for the following items:
   a. Sheet pile installation. Plan shall include methods for handling piling, driving, and cut-off methods, details and dimensions of templates and other temporary guide structures for installing the piling.
   b. Pulling piling
   c. Clearing obstructions

2. Approval by the Engineer will not relieve the Contractor of his responsibility to perform work in accordance with these plans and specifications.

H. Driving Equipment:

1. Pile hammer
   a. Make and model
   b. Hammer classification (i.e. diesel, air/steam, vibratory, etc.)
   c. Hammer type (single acting, double acting, etc.)
   d. Energy range
   e. Weight of striking part (impact hammers only)
   f. Total weight
   g. Total length
   h. Maximum stroke, if applicable
   i. Chart of blow count rate versus energy through hammer (impact hammers only)
   j. Eccentric moment, inch-pound (vibratory hammers only)
   k. Dynamic force, tons (vibratory hammers only)
   l. Steady state frequency or frequency range, cycles per minute (vibratory hammers only)

m. Vibrating weight, pounds (vibratory hammers only)
n. Amplitude, inches (vibratory hammers only)
o. Maximum pull capacity, tons (vibratory hammers only)
p. Non-vibrating weight, pounds (vibratory hammers only)
q. Power pack description

2. Driving helmets

3. Capblocks

4. Pile centering guide/template

5. Leads

6. Special driving shoes or points (if used)

I. Pile Driving Records

J. As Built Drawings: Submit marked up drawings showing all deviations from planned arrangement or details that occurred during construction.

1.5 QUALITY ASSURANCE

A. The Contractor shall be fully experienced in all aspects of steel pipe and sheet pile installation. The firm shall be thoroughly experienced in similar installations under like subsurface conditions.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. The manufacturer's logo and mill identification mark shall be provided on the sheet piling as required by the referenced specifications.

B. Steel sheet piling shall be stored and handled in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. Support on level blocks or racks spaced not more than ten (10) feet apart and not more than two (2) feet from the ends. Supports between multiple lifts shall be in a vertical plane. Storage of sheet piling should also facilitate required inspection activities.

C. Protect piling to prevent damage to coatings and to prevent corrosion prior to installation.

1.7 SUBSURFACE INFORMATION

A. Logs of borings made on site are incorporated in an Appendix of these Specifications and boring locations are indicated on the Contract Drawings. The information shown in the boring logs is that available to the Engineer from the Administration for design and estimating purposes. The Contractor, at his own expense, may make additional investigations he considers justified.

## PART 2 – PRODUCTS

2.1 SHEET PILE BULKHEAD

A. Bulkhead layout as shown on the Contract Drawings is based on PZC13 steel sheet piling.

B. Steel sheet pile:

1. ASTM A 572, Grade 50.

2. Sheeting shall be of the size and shape indicated on the Contract Drawings.

C. Testing of steel sheet piling shall meet the requirements of ASTM A 6.

D. The interlocks of sheet piling shall be hot rolled and free-sliding, provide a swing angle suitable for the intended installation, but not less than five (5) degrees.

E. Corners shall be fabricated from structural steel plates and shapes with a minimum web thickness of 1/2-inch. Fabricated units shall be bolted using bolts, washers, and nuts conforming to ASTM A 325. Alternate extruded corners may be used in lieu of fabricated corners.

F. Sheet piling including special fabricated sections shall be full-length sections of the dimensions shown on the Contract Drawings.

G. Provide sheet piling with standard pulling holes.

2.2 STEEL PLATES AND SHAPES

A. Structural steel plates and shapes for fabricated sections shall conform to ASTM A 572, Grade 50.

2.3 BOLTS, NUTS, AND WASHERS

A. ASTM A 325, Type 1 or 2.

2.4 STEEL COATING SYTEM

A. Steel sheet piling and fabricated sections shall be coated in accordance with Section 09970, “Coating of Steel Sheet Pile Structures”.

2.5 PILE DRIVING HAMMER

1. Furnish a hammer capable of providing sufficient force or energy to achieve the required pile penetration considering the hammer impact velocity; ram weight; stiffness of hammer and pile cushions; cross section, length, and total weight of pile; and character of subsurface material to be encountered. The striking part of

the hammer shall in all cases be of sufficient and proper size to drive the pile to the required depth, without damage to the pile.

2. Piles may be driven with air, steam, diesel, hydraulic, or vibratory hammers.

## PART 3 – EXECUTION

### 3.1 ORDER LENGTHS

A. Required tip elevation is shown in the contract drawings.

### 3.2 PLACING AND DRIVING

A. Placing

1. Prior to placement, the pile shall be marked continuously at one (1) foot intervals with paint or keel beginning at an appropriate length above ground (or water) level to allow delineation of pile length during installation.

2. Pilings shall be carefully located as shown on the Contract Drawings. Piling shall be placed plumb with out-of-plumbness not exceeding 0.125-inch per foot (parallel to the bulkhead) and 0.25-inch per foot (perpendicular to the bulkhead) of pile length. Place the pile so the face will not be more than six (6) inches from vertical alignment at any point. Top of pile after cut-off shall be within two (2) inches of the cut-off elevation indicated on the Contract Drawings. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Re-drive all heaved piles to the required tip elevation.

3. Templates

a. Bulkhead Construction: Provide a template or driving frame suitable for aligning, supporting, and maintaining piling in the correct position during setting and driving. Use a system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support the piling until design tip elevation is achieved.

B. Driving

1. Furnish a hammer capable of providing sufficient force or energy to achieve the required pile penetration considering the cross section, length, and total weight of pile; and character of subsurface material to be encountered. Operate at the rate(s) recommended by the manufacturer throughout the entire driving period. Repair damage to piling caused by use of a pile hammer with excess delivered force or energy. In the event a diesel hammer is employed, it shall be equipped with a skirt to prevent fuel spray.

2. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. The use of vibratory hammers should be discontinued and impact hammers employed when the penetration rate due to vibratory loading is one (1) foot or less per minute.

3. When using impact hammers, place driving helmet, or cap and cushion block combination, capable of protecting the head of the pile between top of pile and the ram to prevent impact damage to pile. The helmet or block shall uniformly transmit energy to pile with a minimum loss of energy.

4. Adequate precautions shall be taken to insure that pilings are driven plumb. Where possible, drive pile with the ball end leading. If an open socket is leading, a bolt or similar object placed in the bottom of the interlock will minimize packing material into it and ease driving for the next sheet.

5. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. Incrementally sequence driving of individual piles such that the tip of any sheet pile shall not be more than four (4) feet below that of any adjacent sheet pile. If the piling next to the one driven tends to follow below final elevation it may be pinned to the next adjacent piling. Piles shall be driven to the tip elevation(s) indicated on the Contract Drawings.

C. Obstructions: If obstructions restrict driving a piling to the specified elevation the obstruction shall be removed or penetrated with a chisel beam at no additional cost to the City. If the Contractor demonstrates that removal or penetration is impractical the Engineer shall modify the alignment of the piling to maintain the integrity of the structure.

D. Jetting: Jetting of piles is not permitted.

E. Splicing: Piles driven below the required top elevation and piles damaged by driving and cut off to permit further driving shall be extended as required to reach the top elevation by splicing when directed by the Engineer. If splices are required in adjoining piles the splices must be spaced at least two (2) feet apart in elevation. Splicing of sheet piles shall be performed using a full penetration weld. Welding procedures shall be submitted to the Engineer for approval.

F. Welding of splices shall conform to the requirements of AWS D1.1. Ends of piles to be spliced shall be squared before splicing to eliminate dips or camber. Splice piles with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced piles shall be free sliding and able to obtain the maximum swing with contiguous piles. Repair coating on and around patches in accordance with Section 09970, “Coating of Steel Sheet Pile Structures.”

G. Patching: Holes in sheet piles shall be made watertight by welding steel plates over the holes after the pile installation is complete. Repair coating on and around patches in accordance with Section 09970, “Coating of Steel Sheet Pile Structures.”

## 3.4 INSPECTION OF DRIVEN PILING

A. Perform continuous inspection during pile driving. Inspect all piles for compliance with tolerance requirements. Bring any unusual problems which may occur to the attention of the Engineer.

3.5 INSTALLATION RECORDS

A. Maintain a pile driving record for each sheet pile.

B. Indicate on the installation record installation dates and times, type and size of hammer, rate of operation, total driving time, dimensions of driving helmet and cap used, blows or time for vibratory hammer required per foot for the final 15 feet of penetration, final driving resistance or time for vibratory hammer in blows for final 6 inches, pile locations, tip elevations, ground elevations, cut-off elevations, and any reheading or cutting of piles.

C. Record any unusual pile driving problems during driving. Notify the Engineer of any such occurrences.

3.6 PILE CUT-OFFS

A. Pile cut-offs shall become the property of the Contractor and shall be disposed of offsite.

B. Trim the tops of piles excessively battered during driving, when directed, at no additional cost. Use a straight edge in cutting by burning to avoid abrupt nicks. Do not use explosives for cutting.

3.7 FIELD REPAIR OF COATING DAMAGE

A. Repair coating in accordance with Section 09970, “Coating of Steel Sheet Pile Structures.”

3.8 CLEANING

A. The portion of the sheet pile to be embedded in concrete shall be free of oil, grease, scale, dirt, and any other materials that may be deleterious to bonding.

**PART 4 – COMPENSATION**

4.1 PAYMENT

A. Payment for “Furnishing and Installing Bulkhead Wall,” complete, shall be taken to be included in and covered by the unit price item in the Schedule of Values. This price shall include furnishing and installing steel sheet piling and coating of sheeting.

B. The above price shall include all the work described in this Section and shown on the Contract Drawings including all labor, material, services and equipment to complete the work in every respect to the satisfaction of the Engineer.

END OF SECTION

# SECTION 02510

# WATER DISTRIBUTION SYSTEM

## PART 1 – GENERAL

### 1.1 SCOPE

A. The work covered by this Section includes the furnishing of all material and equipment and the performing of all labor to complete the installation of the water pipe and pipe fittings as shown on the Contract Drawings and as herein specified or directed by the Construction Engineer (CE).

B. The work covered by this Section shall include, but is not limited to, the furnishing and installation of:

1. Pipe and pipe fittings.
2. Valves, meters, and backflow preventers.
3. Telescopic sleeves and pipe casing.

### 1.2 RELATED SECTIONS

| | | |
|---|---|---|
| A. | Section 02200 | Earthwork |
| B. | Section 02511 | Disinfection of Water Distribution System |
| C. | Section 03300 | Cast-In-Place Concrete |

### 1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

B. Unless otherwise indicated the most recent edition of the publication, including any revisions, shall be used.

C. American Water Works Association (AWWA)

| | |
|---|---|
| AWWA C104 | (2003) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water |
| AWWA C105 | (2005) Polyethylene Encasement for Ductile-Iron Pipe Systems |
| AWWA C110 | (2003) Ductile-Iron and Gray-Iron Fittings for Water and Other Liquids |
| AWWA C111 | (2007) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings |
| AWWA C150 | (2002) Thickness Design of Ductile-Iron Pipe |
| AWWA C151 | (2002) Ductile Iron Pipe, Centrifugally Cast for Water or Other Liquids |
| AWWA C153 | (2006) Ductile Iron Compact Fittings for Water Service |

| | |
|---|---|
| AWWA C500 | (2002) Metal-Seated Gate Valves for Water Supply Service |
| AWWA C800 | (2005) Underground Service Line Valves and Fittings |
| AWWA C900 | (2007) Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-Inch Through 12-Inch, for Water Transmission and Distribution |

1.4 SUBMITTALS

A. General: Submit the following in accordance with Specification Section 01330 "Submittals," of these Specifications.

B. Certifications, test reports and other submittals shall show the appropriate ASTM or AWWA test(s) for each material.

C. Manufacturer's product data, test reports, certifications, and installation instructions for all materials, including but not limited to:

1. Ductile Iron Pipe and Fittings
2. Reduced Pressure Backflow Preventers
3. Water Meters
4. Joint Restraint Mechanism
5. Telescoping Sleeves and Flexible Joint Restraint Couplings
6. Valve Operating Mechanism

D. Shop drawings shall be submitted for the water system showing the piping materials, size, locations, and elevations. Include details of utility vault piping including connections, supports, pipe restraints, and anchors. Show interface and spatial relationship between piping and electrical work.

E. Closeout Submittals

1. Record drawings of installed water system piping and products
2. Maintenance data and parts lists for water system materials and products. Include this data, product data, shop drawings, and record drawings in a maintenance manual.

## PART 2 – PRODUCTS

2.1 MAIN PIPE AND FITTINGS

All pipes and fittings shall be on the City of Norfolk's Approved Product List.

A. Ductile iron pipe shall be centrifugally cast in either metal or sand molds. The pipe shall be approved ductile iron pipe Class 52. Ductile iron pipe shall be cement lined standard thickness with seal coat in accordance with AWWA C104. The outside surface shall be bituminous coated. All buried pipe shall be polyethylene-encased in accordance with AWWA C105.

B. Ductile iron fittings shall be flexible, restrained fittings in accordance with AWWA C110 and C153. They shall be designed and constructed to withstand a pressure not less than that for the adjacent pipe. The fittings shall be generally Class 350. All ductile iron fittings shall be cement lined standard thickness in conformance with AWWA C104. This lining shall be sealed with bituminous seal coat. The outside surface shall be bituminous coated.

C. All pipe and pipe fittings thickness design shall be Class 52 in conformance with AWWA C150.

D. Valves shall be Ductile Iron AWWA resilient gate valves. Valves shall have standardized mechanical joints as specified.

E. Caps or plugs shall be placed at fitting branches and valves where shown or called for on the Contract Drawings. Caps and plugs shall have standard mechanical joints.

F. Polyethylene Encasement shall be in accordance with AWWA C105.

G. Stone bedding shall be AASHTO M43, Size No. 57 stone.

## PART 3 – EXECUTION

### 3.1 SECURING FITTINGS TO MAINS

A. Pipe, fittings, valves, plugs and caps so located as to be subject to disjointing due to the thrust of internal pressure shall be secured with mechanical joint anchoring fittings as indicated on the plans.

### 3.2 LAYING PIPE

A. Before commencing excavation at each location, dig test pits, as directed by the CE, to determine any underground obstructions. Excavate test pits sufficiently in advance of trench construction so that reasonable changes in line and grade can be made where the location of existing structures varies from that shown. The Contractor shall adjust pipeline profile, as required at connections to existing mains, subject to the approval of the CE. Excavate trench and install pipe bedding in accordance with Section 02200, “Earthwork” and in accordance with the Contract Drawings.

B. The pipes and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. Each length of pipe or fitting just before being lowered into the trench shall be placed on blocks or other supports and the whole internal surface well swabbed out with a solution of chloride of lime in the proportion of 3 ounces per gallon of water by means of a mop mounted on a long handle. The solution shall be made up fresh daily and any left over at the end of the day shall be wasted. The pipe or fitting after being thoroughly swabbed out shall then be carefully lowered into the trench so as to exclude dirt and other foreign substances. After it has been “homed”, the end shall be kept closed with a tight stopper until the next length is laid. At the close of work each day the end of the

pipeline shall be tightly closed with an expansion type stopper so no dirt or foreign substance enters the line. This stopper shall be kept in place until pipe laying is again resumed.

C. Only proper suitable tools and appliances for the safe convenient handling and laying of pipes and fittings shall be used. Pipes, fittings and valves shall be carefully handled and lowered into the trench. Under no circumstances shall any pipe or fitting be dumped or rolled into the trench or be allowed to drop against the pipe or fitting already in the trench. Great care shall be taken to prevent the pipe lining and coating from being damaged. Any lining or coating damaged in any way shall be repaired by the Contractor to the satisfaction of the CE. The ends of pipes shall abut against each other in a manner that no shoulder or unevenness is present on the inside of the main.

D. Special care shall be taken to ensure that the pipes are well bedded on a solid foundation. Any defects due to settlement shall be made good by the Contractor at his own expense. Bell holes shall be dug sufficiently large to insure the making of proper joints. Special precautions shall be exercised to prevent any pipe from resting on rock, concrete, or other structures.

E. Whenever a pipe or fitting requires cutting to fit in the line or to bring it to the required location, the work shall be done in a satisfactory manner with approved cutting tools which will leave a smooth end at right angles to the axis of the pipe and not otherwise damage the pipe or lining. Such cuts shall be made by the Contractor without extra compensation. Cuts shall be made at 90 degrees with the centerline of the pipe so that a framing square placed against the side of the pipe will reveal not more than 1/4-inch variation across the diameter of the pipe in any direction.

F. Push-on joints consist of circular rubber gasket that fits into a specially designed bell or socket end of the pipe and a specially prepared lubricant. File or grind the spigot on field cut pipe lengths to reassemble the pipe as manufactured so that the spigot end will slip into the socket intact without hindrance or gasket damage. Both segments of the pipe joint shall be thoroughly cleaned prior to assembly. Place an identifying mark on pipe that is not furnished with a depth mark on the spigot to show the depth of the socket. The joints shall be assembled in accordance with manufacturer's recommendations.

G. No springing of joints to effect a change in direction will be allowed except by direction of the CE or as shown on the drawings.

H. Fittings, gate valves and valve vaults shall be placed along the water mains where shown on the drawings or where designated by the CE in accordance with the requirements as provided elsewhere in these Specifications.

I. Fittings and valves shall be set and jointed to pipe in the manner specified for cleaning, laying, and jointing pipe. Set valve box at right angle to the water main, centered and plumb over the operating nut of the valve extension stem with nut from 6 inch to 1 foot below top of cover with the box cover flush with the surface of the finished grade. Support as required to maintain nut in position. Before installation, ascertain that valves are in proper working order. If valves are not operating properly, notify the CE immediately. Backfill and compact under and

around valve boxes to ensure no vertical loads are transmitted to the valve operators.

3.3 RESTRAINED JOINT DEVICES

A. Joint restraints shall be provided where indicated on the Contract Documents.

B. The restrained joint system shall have a pressure rating equal to or greater than that of the pipe on which it is used. Restrained joint devices shall be installed in strict accordance with the manufacturer's recommendations.

C. For mechanical joint type ductile iron pipe, the restrained joint system shall be a wedge action restrainer gland. Approved manufacturer's include EBAA Iron, Inc., Sigma Corporation, Ford Meter Box Company, or approved equal.

D. Gaskets used on ductile iron fittings shall be in accordance with AWWA C111.

3.3 CONNECTIONS TO EXISTING MAINS

A. All connections to be installed shall be scheduled with the approval of the Owner and request for permission shall be filed in writing a minimum of 48 hours prior to the time of the proposed connection.

B. Careful attention shall be given to the depth of the new pipeline at points where tie-ins to existing mains are to be made. The existing main shall be uncovered in the presence of the Owner and the new pipeline set to proper elevation to provide for a level tie-in.

C. The allowable duration of the water service interruption shall be approved by the Owner prior to the execution of the Work. Restoration of service due to the Contractor taking too much time to complete the connection or the Contractor's lack of proper equipment, personnel, or materials, shall not entitle the Contractor to any claim for additional time or compensation.

D. The Contractor shall be responsible for ascertaining the exact location, depth, and joint pattern of existing mains prior to making connections. Prior to cutting into any water mains the Contractor shall have on-site all required fittings, pipe, tool, personnel and equipment and shall satisfy the Owner through field measurements, that his fittings will properly join the existing line.

1. Other than specified herein, all material shall be installed in accordance with the manufacture's recommendation.

2. All material shall disinfected in accordance with Specification Section 02511.

3. All connections shall be made in the presence of the Owner.

4. The final connection shall occur once the Contractor has completed all testing has been completed. (Pressure-tested, chlorinated and bacteriological samples collected and indicate no contamination)

E. The centerline of the valve assembly shall be located a minimum distance of 5-1/2 feet from the existing pipe joints.

3.4 TESTING MAINS – In accordance with the Water Distribution System Section 801 by Hampton Roads – Planning District Commission

Pressure Test:

A. New water mains shall be pressure tested in accordance with ANSI/AWWA C600-Section 5.2, except as herein provided. Water mains shall be filled with clean water and subjected to a hydrostatic pressure of 1.5 times the expected working pressure or 150 psig, whichever is greater, measured at the highest point along the test section. The pressure test shall be of at least a two hour duration and any damaged or defective pipe, fittings, valves, or hydrants that are discovered during the pressure test shall be replaced by the Contractor and retested. The Contractor shall furnish all necessary equipment, materials and labor for making the tests as specified. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. Hydrants shall be tested with the main line.

B. The Contractor shall test the line prior to contacting the Owner for the formal pressure test.

C. Testing shall be performed on each section of pipe between main line valves.

D. Water for the pressure test shall be obtained through a fully valved manifold, with an approved backflow preventor, as indicated in the Standard Details.

E. The Contractor shall furnish all pumps, fittings, and gauges as necessary to fill the line with potable water, dispel air from the system, and pressurize the pipeline for the tests.

F. The Owner reserves the right to test gauges to determine their accuracy.

G. The Contractor shall coordinate arrangements for water to be used for the pressure testing with the Owner.

H. The test pressure shall not vary by more than +/- 5 psi for the duration of the test.

I. Testing allowance shall be defined as the quantity of makeup water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi or the specified test pressure after the pipe has been filled with water and the air has been expelled.

J. The Contractor shall provide all necessary temporary restraint and support during testing at no additional cost to the Owner.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02511

# DISINFECTION OF WATER DISTRIBUTION SYSTEM

## PART 1 – GENERAL

1.1 SCOPE

A. The work covered by this Section includes the furnishing of all material and equipment and the performing of all labor to complete the disinfection of the water distribution system as shown on the Contract Drawings and as herein specified or directed by the Construction Engineer (CE).

## PART 2 - EXECUTION

2.1 DISINFECTION

New, relocated, or repaired water mains shall be disinfected in accordance with AWWA Standard C 651, latest revision. The disinfection procedure shall be carried out after completion of construction and immediately before the mains are placed into service. During construction, precautions shall be taken to protect pipe interiors, fittings, and valves against contamination. Cleaning and swabbing of the interior of the pipe may be required if contamination cannot be removed by ordinary flushing and disinfection procedures. The cleaning and swabbing shall be performed with a 5% hypochlorite disinfecting solution, or other disinfecting agent as approved by the Owner. The Contractor shall be responsible for properly treating the discharge during disinfection, testing, and flushing activities.

1. Preliminary Flushing:

All water mains shall be flushed with potable water prior to disinfection. The flushing velocity shall not be less than 2.5 feet per second (FPS). No site for flushing shall be used unless adequate and satisfactory drainage is present, available and operational. It shall be noted that under no circumstances will preliminary flushing be considered a substitute for preventive measures taken before and during water main construction to minimize contamination.

2. Disinfection Solution

Acceptable disinfecting solutions shall include chlorine in a liquid form, in calcium hypochlorite granules or in sodium hypochlorite solutions. All hypochlorite shall conform to AWWA Standard B 300, latest revision.

a. The chlorine concentration in the newly installed main shall be introduced at a minimum 50-ppm available chlorine. The chlorinated water shall be retained in the main for at least 24 hours during which time all valves and appurtenances in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24-hour period, the treated water shall contain no less than 10-ppm chlorine throughout the length of the main. The procedure for the

introduction of disinfecting solutions shall be in accordance with the Standard Details.

b. In water distribution systems using chloramines as the disinfectant, water from the distribution system no longer has a free chlorine residual, but instead has a combined chlorine residual. The combined chlorine will exert a free chlorine demand of approximately 5 ppm. Thus, the make-up water (if supplied from the water distribution system) will neutralize approximately 5 ppm of free chlorine. This 5 ppm free chlorine demand must be taken into account in determining the amount of chlorine necessary to achieve a 50 ppm free chlorine residual.

3. Final Flushing

After the retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the existing system or less than 1 ppm. In water distribution systems using chloramines as the disinfectant, the heavily chlorinated water shall be flushed until all traces of free chlorine are absent (i.e. free chlorine residual = 0.0 ppm) The flushing shall be conducted in the presence of and only with the approval of the Owner.

4. Point of Discharge

The Contractor shall discharge the chlorine solution from the water main through available outlets, or through taps in the main installed at the Contractor's expense. The environment to which the chlorinated water is to be discharged shall be inspected by the Contractor. If there is any question that the chlorinated discharge will cause damage to the environment, then a reducing agent shall be applied to the water as it is wasted to thoroughly and completely neutralize the chlorine residual in the water. (See Table, Amount of Agent Required to Neutralize Various Residual Chlorine Concentrations.) Where necessary, federal, state, and local regulatory agencies should be contacted by the Contractor to determine special provisions for the disposal of heavily chlorinated water.

**TABLE**
**Amount of Agent Required to Neutralize Various Residual Chlorine Concentrations for 100,000 Gallons of Water**

| Residual Chlorine ppm | Sulfur Dioxide LB | Sodium Biosulfate LB | Sodium Sulfite LB | Sodium Thiosulfate LB |
|---|---|---|---|---|
| 1 | 0.6 | 1.2 | 1.4 | 1.2 |
| 2 | 1.7 | 2.5 | 2.9 | 2.4 |
| 10 | 8.3 | 12.5 | 14.6 | 12.0 |
| 50 | 41.7 | 62.6 | 73.0 | 60.0 |

To estimate the minimum flushing time and the amount of neutralizing agent needed,
use the following, where:

L = length of pipe being chlorinated, feet

t = estimated minimum flushing time, seconds
FR = flow rate, from Table 801-2, as function of pipe diameter, GPM
V = flushing discharge volume, gallons
N = estimated amount of neutralizing agent as function of concentration, from Table above, pounds

1. Determine the estimated minimum flushing time, t, in seconds:

   $t = L/2.5$

2. Determine the estimated minimum flushing discharge, V, in gallons:

   $V = (t + 300)60 \times FR$

3. Determine the estimated amount of neutralizing agent, N, in pounds:

   N = V / 100,000 x (Table 801-3 value for given residual chlorine and type of neutralizing agent)

5. Bacteriological Tests:

After final flushing and before the water main is placed in service, the Contractor shall collect samples and have the samples tested for bacteriological quality by a State Health Department approved laboratory. The samples shall be collected in sterile containers. At least two consecutive satisfactory bacteriological samples shall be taken from sections not exceeding 2,000 feet in length at 24-hour intervals. Chlorine residual measurements shall be taken and recorded at the time each sample is collected.

6. Re-disinfection

If the initial disinfection produces positive results for coliform, the main shall be reflushed and the sampling procedure repeated. If these samples are positive for coliform, then the main shall be re-chlorinated and the sampling procedure repeated.

7. Supervision

The disinfection and testing procedure shall be carried out by the Contractor under the supervision of the Owner. Water mains shall be placed in service only after final approval has been issued by the Owner contingent upon test results.

## PART 3 – COMPENSATION

3.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02722

# AGGREGATE BASE

## PART 1 – GENERAL

### 1.1 DESCRIPTION

A. Furnish all tools, equipment, labor, materials, supervision, coordination, transportation administration, incidentals, and expertise necessary for furnishing, spreading and compacting aggregate base complete in place, in strict accordance with the specifications and requirements of the Contract Documents.

B. The work in this section includes, but is not limited to:

1. Furnishing aggregate base, including recycling of on site concrete and asphalt materials.

2. Mixing recycled materials and import aggregate base and spreading to the depth and surface elevation indicated on the Plans.

C. Related work specified elsewhere.

1. Section 01330 – Submittal Procedures

2. Section 02200 - Earthwork

3. Section 02745 - Asphalt Concrete Mixtures

### 1.2 REFERENCE STANDARDS

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

| | |
|---|---|
| AASHTO T96 | Standard Specification for Resistance to Degradation of Small-Size Course Aggregates by Abrasion and Impact in the Los Angeles Machine |
| AASHTO T103 | Soundness of Aggregates by Freezing and Thawing |
| ASTM C 33 | (1997) Concrete Aggregates |
| ASTM D 1556 | (1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method |
| ASTM D 1557 | (1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft (2,700 kN-m/m)) |
| ASTM D 1586 | (1984; R 1992) Penetration Test and Split-Barrel Sampling of Soils |
| ASTM D 2487 | (1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System) |

| | |
|---|---|
| ASTM D 2922 | (1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) |
| ASTM D 3017 | (1996) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) |
| ASTM D 4253 | (1993) Maximum Index Density of Soils Using a Vibratory Table |
| ASTM D 4254 | (1991) Minimum Index Density and Unit Weight of Soils |

CORPS OF ENGINEERS (COE)

| | |
|---|---|
| COE EM-385-1-1 | (1996) Safety and Health Requirements Manual |

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

| | |
|---|---|
| VDOT | 2007 Virginia Department of Transportation Road and Bridge Specifications |

1.3 QUALITY ASSURANCE

A. Perform the acquisition placing and compacting of aggregate base in compliance with the applicable requirements of the VDOT Road and Bridge Specifications, 2007, and other criteria specified herein.

1.4 DEFINITIONS

A. Backfill: Material used in refilling a cut, trench or other excavation.

B. Cohesive Materials: Soils classified by ASTM D 2487 as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesive only when fines have a plasticity index greater than zero.

C. Cohesionless Materials: Soils classified by ASTM D 2487 as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero.

D. Compaction: The process of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of Compaction" is expressed as a percentage of the maximum density obtained by the test procedure described in ASTM D 698 or ASTM D 1557 for general soil types or ASTM D 4253 or ASTM D 4254 (Relative Density) for isolated cohesionless materials, abbreviated in this specification as "_____ percent ASTM D _____ maximum density."

E. Fill: Specified material placed at a specified degree of compaction to obtain an indicated grade or elevation.

F. In-Situ Soil: Existing in place soil.

G. Lift: A layer (or course) of soil placed on top of subgrade or a previously prepared or placed soil in a fill or backfill.

H. Refill: Material placed in excavation to correct overcut in depth.

I. Subgrade: The material in excavation and fills immediately below any subbase, base, pavement or other improvement.

J. Topsoil: In natural or undisturbed soil formations, the fine-grained, weathered material on the surface or directly below any loose or partially decomposed organic matter. Topsoil may be a dark-colored, fine, silty, or sandy material with a high content of well-decomposed organic matter, often containing traces of the parent rock material. Gradation and material requirements specified herein apply to all topsoil references in this contract. The material shall be representative of productive soils in the vicinity.

K. Unsatisfactory Material: In-Situ soil or other material which can be identified as having insufficient strength characteristics or stability to carry intended loads in the trench without excessive consolidation or loss of stability. Also backfill material which contains refuse, frozen material, large rocks, debris, soluble particles, and other material which could damage the pipe or cause the backfill not to compact. Materials classified as PT, OH, or OL by ASTM D 2487 are unsatisfactory.

L. Unstable Material: Material in the trench bottom which lacks firmness to maintain alignment and prevent joints from separating in the pipe, conduit, or appurtenance structure during backfilling. This may be material otherwise identified as satisfactory which has been disturbed or saturated.

## 1.5 SUBMITTALS

A. Submit the following in accordance with Section 01330.

1. Test Reports

a. Aggregate base tests

## 1.6 REGULATORY REQUIREMENTS

A. Materials and workmanship specified with reference to VDOT requirements shall be in accordance with the referenced articles, sections, and paragraphs of the standard except that contractual and payment provisions do not apply. Where the term "Engineer" is used, it shall mean the CE. Where the term "state" is used, it shall mean the Owner.

## 1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store materials in a manner to prevent contamination, segregation, freezing, and other damage.

1.8 CRITERIA FOR BIDDING

A. Base bids on the following criteria:

1. Surface elevations are as indicated.

2. Blasting will not be permitted.

1.9 PROTECTION

A. Density and moisture tests: Submit field test data sufficiently in advance of construction so as not to delay work. Submit within 7 days of test date.

1.10 PROTECTION OF PERSON AND PROPERTY

A. Barricade areas where surface elevations are significantly different and could present a safety hazard to persons and vehicles. Protect adjacent facilities from damage.

**PART 2 – PRODUCTS**

2.1 AGGREGATE BASE

A. Aggregate Base Material: Clean crushed stone or gravel conforming to the requirements of Section 208 of VDOT Specification for Type I, size No. 21A as modified herein:

1. Slag, recycled concrete, or recycled asphalt pavement shall not be imported to the site or used in the work.

2. Recycled concrete and asphalt concrete originating on site may be used as aggregate base if the gradation of the crushed materials meets the requirements specified for aggregate base.

**PART 3 – EXECUTION**

3.1 PROTECTION

A. Provide shoring and sheeting where required for construction.

3.2 SURFACE PREPARATION

A. Prior to placing aggregate base the sub-grade compaction test results shall be approved in writing by the CE.

3.3 COMPACTION

A. The surface upon which the base or subbase is to be placed shall be prepared in accordance with the applicable related sections of these Specifications. All subgrade material which has become wet will be dried and rolled until specified compaction has been obtained.

B. Should visual examination reveal that the material in any load is obviously contaminated or segregated, the load will be rejected without additional sampling or tests.

C. Equipment used for placement of the aggregate base course shall be approved prior to performing any such work. Any machine, combination of machines or equipment for spreading, moistening, mixing and compacting which will handle the material without undue segregation and produce the completed base in accordance with these Specifications will be approved.

D. Where the required thickness is more than 6 inches, the material shall be spread and compacted in 2 or more layers of approximately equal thickness, the maximum compacted thickness of any layer not to exceed 6 inches. When vibrating or other approved types of special compacting equipment are used, the compacted depth of a single layer of the base course may be increased to 8 inches upon approval.

E. After mixing and shaping, each layer shall be compacted within plus or minus two percent of its optimum moisture. The density of each layer of aggregate base course shall be 95 percent ASTM D 1557 maximum density.

F. Any irregularities in the surface shall be corrected by scarifying, remolding, reshaping and re-compacting until a smooth surface is secured. The surface shall thereafter be protected against the loss of fine material by the addition of moisture, when necessary, and shall be maintained in a satisfactory and smooth condition until accepted by the CE. The cost of additional moisture will not be a pay item but shall be incidental to the cost of the material.

G. Use hand-operated, plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors.

H. Avoid damaging pipes and protective pipe coatings.

3.5 FIELD QUALITY CONTROL

A. Test aggregate base course for conformance to specified requirements. Test aggregate base course to be used under roads and paved areas for conformance to special requirements. Perform density and moisture tests in randomly selected locations and in accordance with ASTM D 1556 or ASTM D 2922 at a minimum of one test per lift per 1,000 square yards.

B. Where ASTM D 2922 and ASTM D 3017 are used to test field compaction densities, verify test results by performing at least one test per day using ASTM D 1556 at a location already tested in accordance with ASTM D 2922. Perform at least one additional test using ASTM D 1556 for every ten tests performed with a nuclear device, at locations checked in accordance with ASTM D 2922.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

**SECTION 02725**

**DRAINAGE PIPE**

## PART 1 – GENERAL

1.1 DESCRIPTION

A. The work covered by this section consists of all excavation, bedding, laying pipe, jointing and coupling pipe sections, and backfilling necessary to install the various types of pipes, pipe culverts and fittings required to complete the project. The Contractor shall furnish all equipment, tools, labor and materials necessary to complete the work in accordance with the plans and specifications.

B. The work in this section includes, but is not limited to:

1. Furnishing concrete pipe and appurtenances.

2. Trenching, excavation, backfilling, and compaction.

C. Related work specified elsewhere.

1. Section 01330 – Submittal Procedures

2. Section 02200 - Earthwork

1.2 REFERENCE STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM C76 | (2008) Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe |

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

| | |
|---|---|
| VDOT | 2007 Virginia Department of Transportation Road and Bridge Specifications |

1.3 QUALITY ASSURANCE

A. Perform the acquisition placing and compacting of aggregate base in compliance with the applicable requirements of the VDOT Road and Bridge Specifications, 2007, and other criteria specified herein.

1.5 SUBMITTALS

A. Submit the following in accordance with Section 01330.

1. Shop Drawings

Provide shop drawings consisting of catalog cuts and related data.

1.6 REGULATORY REQUIREMENTS

A. Materials and workmanship specified with reference to VDOT requirements shall be in accordance with the referenced articles, sections, and paragraphs of the standard except that contractual and payment provisions do not apply. Where the term "Engineer" is used, it shall mean the CE. Where the term "state" is used, it shall mean the Owner.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store materials in a manner to prevent contamination, segregation, freezing, and other damage.

1.8 CRITERIA FOR BIDDING

A. Base bids on the following criteria:

1. Surface elevations are as indicated.

2. Blasting will not be permitted.

1.9 PROTECTION

A. Density and moisture tests: Submit field test data sufficiently in advance of construction so as not to delay work. Submit within 7 days of test date.

1.10 PROTECTION OF PERSON AND PROPERTY

A. Barricade areas where surface elevations are significantly different and could present a safety hazard to persons and vehicles. Protect adjacent facilities from damage.

**PART 2 – PRODUCTS**

2.1 REINFORCED CONCRETE PIPE

A. Drainage pipe and culverts shall conform to local and state Department of Transportation requirements.

B. Shop drawings consisting of catalog cuts and related data shall be submitted by the Contractor to the Engineer for approval.

C. All reinforced concrete pipe shall be clearly marked showing the pipe class, type of wall and date of manufacture.

D. Reinforced concrete drainage pipe shall conform to ASTM C76, Class III, wall thickness B. Joints shall be tongue and groove.

## PART 3 – EXECUTION

3.1. GENERAL REQUIREMENTS

A. Drainage pipes and culverts of the type and quantity and in the locations as called for on the plans or as directed by the Engineer shall be installed in conformance with local and state Department of Transportation requirements.

B. Where proposed culverts are to be installed under existing roadways, the construction shall be performed in such a way that half the roadway will be maintained and available to traffic or as directed by the governing agency.

3.2. UNLOADING AND HANDLING

A. All pipes shall be unloaded and handled with reasonable care. When any joint or section of pipe is damaged during unloading or handling, the undamaged portions of the joint or section may be used where partial lengths are needed or, if damaged sufficiently, the Engineer will reject the joint or section as being unfit for installation and the Contractor shall remove such rejected pipe from the project, at no cost to the Owner.

3.3. PREPARATION OF PIPE FOUNDATION

A. The pipe foundation shall be prepared in accordance with the applicable method shown on the plans and shall be true to line and grade and uniformly firm. Bedding material shall be placed and shaped beneath the pipe. The pipe foundation shall be shaped to fit the outside of the pipe for at least 10% of its outside diameter under all pipe culverts. Where bell and spigot type pipe is used, recesses shall be excavated to receive the pipe bells.

B. Where the foundation material is found to be of poor supporting value or of rock, the Engineer may make minor adjustment in the location of the pipe to provide a more suitable foundation. Where this is not practical, the foundation shall be conditioned by removing the existing foundation material by undercutting to the depth as directed by the Engineer, within the limits established on the plans, and backfilling with either a suitable local material secured from unclassified excavation or borrow excavation at the nearest accessible location within the project, or foundation conditioning material consisting of crushed stone or gravel or a combination of sand and crushed stone or gravel approved by the Engineer as being suitable for the purpose intended. The selection of the type of backfill material to be used for foundation conditioning will be made by the Engineer.

C. When necessary, the Contractor shall provide for the temporary diversion of water or dewatering in order to maintain the pipe foundation in a dry condition, and shall continue to maintain the trench in a dry condition until backfill and compaction activities are complete.

3.4. LAYING PIPE

A. Rigid pipe shall be carefully laid on the prepared foundation, bell or groove end upgrade with the spigot or tongue fully inserted and each joint check for alignment and grade as the work proceeds. Flexible plastic joint material shall be used. Joint material of other type or design may be used when designated on the plans, by special provisions, or when permitted in writing by the Engineer.

3.5. BACKFILLING

A. The fill around the pipe shall be placed in accordance with the applicable method shown on the plans, and shall be placed in layers not to exceed 6 inches loose unless otherwise approved by the Engineer and compacted to the density required. Select backfill material shall be used when called for on the plans.

B. Care shall be taken during backfill and compaction operations to maintain alignment and prevent damage to the joints. The backfill shall be kept free from stones, frozen lumps, chunks of highly plastic clay, or other objectionable material.

C. All pipe backfill areas shall be graded and maintained in such a condition that erosion or saturation will not damage the pipe bed or backfill.

D. Heavy equipment shall not be operated over any pipe until it has been properly backfilled and has a minimum cover as required by the plans. Where any part of the required cover is above the proposed finish grade, the Contractor shall place, maintain, and finally remove such material at no cost to the Owner. Pipe which becomes misaligned, shows excessive settlement, or has been otherwise damaged by the Contractor's operations shall be removed and replaced by the Contractor at no cost to the Owner.

3.6. MAINTENANCE

A. The Contractor shall maintain all pipe installations in a condition such that they will function continuously from the time the pipe is installed until the project is accepted.

B. The Engineer may require the Contractor to thoroughly clean out and maintain all existing pipe and drainage structures at his own expense when necessary erosion control measures not taken by the Contractor resulted in fouling existing drainage systems.

3.7. REINFORCED CONCRETE PIPE

A. Reinforced concrete drainage pipe shall be installed so as to prevent damage to the pipe. Joints shall be mortar or packing type, and shall be close fitting and generally watertight. Elliptical pipe shall be installed with the major axis horizontal.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02745

# ASPHALT CONCRETE MIXTURES

## PART 1 – GENERAL

1.1 DESCRIPTION

A. The work to be performed under this Section shall consist of furnishing labor, materials, equipment, and services necessary to construct asphalt concrete pavement, including aggregate base to the sections and at the locations as specified in this Section and as indicated on the Contract Drawings.

B. Related work specified elsewhere.

1. Section 01330 – Submittal Procedures

1.2 REFERENCE STANDARDS

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

| | |
|---|---|
| AASHTO T 166 | Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-dry Specimens |
| AASHTO T 209 | Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures |
| AASHTO T 283 | Resistance of Compacted Bituminous Mixtures to Moisture-Induced Damage |

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

| | |
|---|---|
| VDOT | 2007 Virginia Department of Transportation Road and Bridge Specifications |

1.3 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330.

1. Product data showing conformance to VDOT Specifications and this Specification.

## PART 2 – PRODUCTS

2.1 MATERIALS

Two mix types are required for this project:

1. SM-9.5 A

2. BM-25.0 A

## PART 3 – EXECUTION

3.1 PLACING ASPHALT CONCRETE PAVEMENT

A. Place in accordance with VDOT Road and Bridge Specifications.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 02761

# PAVEMENT MARKINGS

## PART 1 – GENERAL

1.1 DESCRIPTION

A. The work to be performed under this section shall consist of furnishing labor, materials, and equipment necessary to apply pavement markings to match the existing layout of Granby Street.

B Related Work Specified Elsewhere

1. Section 01330 – Submittal Procedures

1.2 REFERENCE STANDARDS

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

| | |
|---|---|
| VDOT | 2007 Virginia Department of Transportation Road and Bridge Specifications |

1.3 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330.

1. Product data showing conformance to VDOT Specifications.

## PART 2 – PRODUCTS

2.1 MATERIALS

A. Shall conform to the VDOT Standards for road markings.

## PART 3 – EXECUTION

3.1 PAVEMENT STRIPING AND MARKING

A. General: Pavement striping and marking shall conform to the provisions in VDOT Standard Specifications, Section 704.

B. Control of Alignment and Layout: All work necessary to establish satisfactory alignment for stripes and all layout work required for pavement markings shall be performed by the Contractor with any device or method that will not damage the pavement nor conflict with other traffic control devices.

C. Tolerances and Appearance: Completed stripes shall have clean and well-defined edges without running or deformation, shall be uniform, shall be straight on tangent alignment and shall be on a true arc on curved alignment. The widths of completed traffic stripes shall not deviate more than 0.25-inch on tangent nor more than 0.5-inch on curves from the widths

D. Protection From Damage: The Contractor shall take special care to protect existing pavement stripes, marks and markers and shall, at the Contractor's expense, repair all damage to existing stripes, marks and markers.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 03300

# CAST-IN-PLACE CONCRETE

## PART 1 - GENERAL

### 1.1 SUMMARY

Work under this section includes requirements for materials, mixing, forming, placing, finishing, and curing reinforced cast-in-place concrete. The Contractor shall provide all labor, materials, equipment, and incidental items necessary to provide all cast-in-place concrete indicated on the project drawings and as specified herein.

### 1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

| | |
|---|---|
| AASHTO M182 | (1991, R 2000) Burlap Cloth Made from Jute or Kenaf |

AMERICAN CONCRETE INSTITUTE (ACI)

| | |
|---|---|
| ACI 117 | (1990; R 2002) Standard Tolerances for Concrete Construction and Materials |
| ACI 211.1 | (1991; R 2002) Standard practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete |
| ACI 301 | (2005) Specifications for Structural Concrete for Buildings |
| ACI 302.1R | (2004) Guide for Concrete Floor and Slab Construction |
| ACI 304R | (2000) Guide for Measuring, Mixing, Transporting, and Placing Concrete |
| ACI 304.2R | (1996) Placing Concrete by Pumping Methods |
| ACI 305R | (1999) Hot Weather Concreting |
| ACI 306.1 | (1990; R 2002) Standard Specification for Cold Weather Concreting |
| ACI 318M/318RM | (2002) Metric Building Code Requirements for Structural Concrete and Commentary |
| ACI 347R | (2003) Guide to Formwork for Concrete |
| ACI SP-66 | (2004) ACI Detailing Manual |

AMERICAN HARDBOARD ASSOCIATION (AHA)

| | |
|---|---|
| AHA A135.4 | (1995) Basic Hardboard |

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM A 82 | (2005) Steel Wire, Plain, for Concrete Reinforcement |
| ASTM A 496 | (2002) Steel Wire, Deformed, for Concrete Reinforcement |
| ASTM A 615/A 615M | (2005a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement |
| ASTM A 616/A 616M | (1996a) Rail-Steel Deformed and Plain Bars for Concrete Reinforcement |
| ASTM A 775/A 775M | (2006) Standard Specification for Epoxy-Coated Steel Reinforcing Bars |
| ASTM C 31/C 31M | (2003a) Making and Curing Concrete Test Specimens in the Field |
| ASTM C 33 | (2003) Concrete Aggregates |
| ASTM C 39 | (1996) Compressive Strength of Cylindrical Concrete Specimens |
| ASTM C 78 | (2008) Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading) |
| ASTM C 94/C 94M | (2004a) Ready-Mixed Concrete |
| ASTM C 109 | (1999) Test method for Compressive Strength of Hydraulic Cement Mortars |
| ASTM C 143/C 143M | (2005) Slump of Hydraulic Cement Concrete |
| ASTM C 150 | (2005) Portland Cement |
| ASTM C 171 | (2003) Sheet Materials for Curing Concrete |
| ASTM C 172 | (2004) Sampling Freshly Mixed Concrete |
| ASTM C 173/C 173M | (2001e1) Air Content of Freshly Mixed Concrete by the Volumetric Method |
| ASTM C 192/C 192M | (2005) Making and Curing Concrete Test Specimens in the Laboratory |
| ASTM C 227 | (2003) Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method) |

| | |
|---|---|
| ASTM C 231 | (2004) Air Content of Freshly Mixed Concrete by the Pressure Method |
| ASTM C 260 | (2001) Air-Entraining Admixtures for Concrete |
| ASTM C 295 | (2003) Petrographic Examination of Aggregates for Concrete |
| ASTM C 309 | (2003) Liquid Membrane-Forming Compounds for Curing Concrete |
| ASTM C 494/C 494M | (2005) Chemical Admixtures for Concrete |
| ASTM C 618 | (2005) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete |
| ASTM C 881 | (1999) Epoxy-Resin-Base Bonding Systems for Concrete |
| ASTM C 882 | (1999) Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete by Slant Shear |
| ASTM C 1017/C 1017M | (2003) Chemical Admixtures for Use in Producing Flowing Concrete |
| ASTM C 1107 | (2005) Packaged Dry, Hydraulic-Cement Grout (Nonshrink) |

AMERICAN WELDING SOCIETY (AWS)

| | |
|---|---|
| AWS D1.4 | (2000) Structural Welding Code - Reinforcing Steel |

VIRGINIA DEPARTMENT OF TRANSPORTATION

| | |
|---|---|
| VDOT | (2007) Road and Bridge Specifications |

## 1.3 DEFINITIONS

A. "Cementitious material" as used herein shall include all Portland cement and fly ash.

B. "Exposed to public view" means situated so that it can be seen from eye level from a public location after completion of the structure. A public location is accessible to persons not responsible for operation or maintenance of the structure.

## 1.4 SUBMITTALS

Submit the following in accordance with the General Conditions of the Contract.

### 1.4.1 Shop Drawings

A. Reinforcing steel

Reinforcing steel shall conform to ACI SP-66. Indicate bending diagrams, assembly diagrams, splicing and laps of bars, shapes, dimensions, and details of bar reinforcing, accessories, and concrete cover. Do not scale dimensions from structural drawings to determine lengths of reinforcing bars. Reproductions of contract drawings are unacceptable.

1.4.2 Product Data

A. Materials for curing concrete

Submit proposed materials and methods for curing concrete elements.

B. Materials for placing and curing grout

Submit proposed materials and methods for placement and curing of grout beds for mooring hardware, crane and roadrail rails and other miscellaneous grout installations.

C. Epoxy bonding compound

D. Pumping concrete

Submit proposed materials and methods for pumping concrete. Submittal shall include mix designs, pumping equipment including type of pump and size and material for pipe, and maximum length and height concrete will be pumped.

E. Non-Shrink Grout

1.4.3 Design Data

A. Concrete mix design

Thirty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete.

Submit a complete list of materials including type; brand; source and amount of cement, fly ash, and admixtures; and applicable reference specifications. Provide mix proportion data using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required. If source material changes, resubmit mix proportion data using revised source material. No material shall be provided unless proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Engineer.

The submittal shall clearly indicate where each mix design will be used when more than one mix design is submitted. Submit additional data regarding concrete aggregates if the source of aggregate changes. In addition, copies of the fly ash test results shall be submitted.

Submit copies of laboratory test reports by independent test labs conforming to ASTM C 1077, showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable for the job conditions. Obtain acknowledgement of receipt prior to concrete placement.

1.4.4 Test Reports

A. Concrete mix design

Submit copies of laboratory test reports showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable for the job conditions. The laboratory test reports shall include mill test and all other test for cement, aggregates, and admixtures. Provide maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Test reports shall be submitted along with the concrete mix design. Obtain approval before concrete placement.

B. Compressive strength tests

C. Fly Ash

Submit test results in accordance with ASTM C 618 for fly ash. Submit test results performed within 6 months of submittal date.

D. Aggregates

ASTM C 227 for potential alkali-silica reactions, ASTM C 295 for petrographic analysis.

1.4.5 Certificates

A. Cement: Submit Certificate of Conformance in accordance with ASTM C 150 Portland cement and/or ASTM C 595 and ASTM C 1157 for blended cement.

B. Aggregates: Submit Certificate of Conformance for aggregate quality in accordance with ASTM C 33, and the combined gradation curve for grading proposed for use in the work and used in the mixture qualification, and ASTM C 295 for results of petrographic examination. Where there is potential for alkali-silica reaction, provide results of tests conducted in accordance with ASTM C 227 or ASTM C 1260. Submit results of all tests during progress of the work in tabular and graphical form as noted above, describing the cumulative combined aggregate grading and the percent of the combined aggregate retained on each sieve.

C. Admixtures: Submit Certificate of Conformance in accordance with ASTM C 494 and ASTM C 1017 for concrete admixtures, ASTM C 260 for air-entraining agent, and manufacturer's literature and test reports for corrosion inhibitor and anti-washout admixture. Submitted data shall be based upon tests performed within 6 months of submittal.

D. Fly ash: Submit Certificate of Conformance in accordance with ASTM C 618. Submit test results performed within 6 months of submittal date.

1.5 MODIFICATION OF REFERENCES

Accomplish work in accordance with ACI publications except as modified herein. Consider the advisory or recommended provisions to be mandatory, as though the word "shall" had been substituted for the words "should" or "could" or "may," wherever they appear. Interpret

reference to the "Building Official," the "Structural Owner," and the "Architect/Owner" to mean the Designer.

1.6 DELIVERY, STORAGE, AND HANDLING

Do not deliver concrete until forms, reinforcement, embedded items, and chamfer strips are in place and ready for concrete placement. ACI 301 for job site storage of materials. Protect materials from contaminants such as grease, oil, and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

1.6.1 Reinforcement

Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil, and dirt. Ensure bar sizes can be accurately identified after bundles are broken and tags removed.

1.6.1.1 Epoxy Coated Reinforcing Steel

Record coating lot on each shipping notice and carefully identify and retag bar bundles from bending plant. Provide systems for handling coated bars which have padded contact areas, nylon slings, etc., all free of dirt and grit. Lift bundled coated bars with strong back, multiple supports, or platform bridge to prevent sagging and abrasion. Bundling bands shall be padded where in contact with bars. Do not drop or drag bars or bundles. Store coated bars both in shop and in field, aboveground, on wooden or padded cribbing. Space the dunnage close enough to prevent excessive sags. Stack large quantities of straight bars with adequate protective blocking between layers. Schedule deliveries of epoxy coated bars to the job site to avoid the need for long term storage. Protect from direct sunlight and weather. Bars to be stored longer than 12 hours at the job site shall be covered with opaque polyethylene sheeting or other suitable equivalent protective material.

## PART 2 - PRODUCTS

2.1 MATERIALS FOR FORMS

Provide wood, plywood, or steel. Use plywood or steel forms where a smooth form finish is required. Lumber shall be square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects. Plywood: PS-1, B-B concrete form panels or better or AHA A135.4, hardboard for smooth form lining. Steel form surfaces shall not contain irregularities, dents, or sags.

2.2 FORM TIES AND ACCESSORIES

The use of wire alone is prohibited. Form ties and accessories shall not reduce the effective cover of the reinforcement.

## 2.3 CONCRETE

### 2.3.1 Contractor-Furnished Mix Design

Mix Design shall be in accordance with VDOT Class A4 concrete, ACI 211.1, ACI 301, ACI 318M/318RM, and ACI 304.2R except as otherwise specified. The compressive strength (f'c) of the concrete for each portion of the structure(s) shall be as indicated and as specified below or as indicated in the plans.

| Location | f'c<br>Min. 28-Day Comp. Strength (psi) | Aggregate<br>ASTM C 33 Maximum Nominal (Size No.) | Slump<br>ASTM C 143 Maximum Range (inches) | Water-Cement<br>Maximum Ratio (by weight) | Air Entr.<br>(percent) |
|---|---|---|---|---|---|
| All Concrete | 4000 | 57 | 4 | 0.40 | 5 |

In addition to the above referenced requirements, all concrete slabs-on-grade shall have a minimum flexural strength of 750 psi at 28 days in accordance with ASTM C 78.

The concrete mixture shall be proportioned to have, at the point of deposit, a maximum slump of 4 inches as determined by ASTM C 143. Where an ASTM C 494, Type F or G admixture is used, the slump after the addition of the admixture shall be no less than 6 inches nor greater than 8 inches. Slump tolerances shall comply with the requirements of ACI 117.

Provide air entrainment using air-entraining admixture. Air entrainment shall be within plus or minus 1.5 percent of the value specified and shall conform to the air limits specified in ACI 301.

The water soluble chloride ion concentrations in hardened concrete at ages from 28 to 42 days shall not exceed 0.15

Fly ash shall not be used for more than 25 percent by mass of the cementitious material.

The minimum amount of Portland cement is 75 percent of the total mass of cementitious material.

The requirements for durability consideration specified in table below shall be incorporated in the mixture proportions.

Concrete Quality Requirements:

| Location | Water-Cement<br>Maximum ratio (by weight) | Cementitious Material<br>Minimum quantity lb/yd3 | Portland Cement<br>Minimum quantity lb/yd3 |
|---|---|---|---|
| All Concrete | 0.40 | 675 | 505 |

2.3.1.1 Mix Proportions for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified shall be the responsibility of the Contractor. Mixture proportions shall be based on compressive strength as determined by test specimens fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39. Samples of all materials used in mixture proportioning studies shall be representative of those proposed for use in the project and shall be accompanied by the manufacturer's or producer's test report indicating compliance with these specifications. Trial mixtures having proportions, consistencies, and air content suitable for the work shall be made based on methodology described in ACI 211.1. The trial mixture shall use at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required on the project. The maximum water-cement ratio required will be based on equivalent water-cement ratio calculations as determined by the conversion from the weight ratio of water to cement by weight equivalency method.

Laboratory trial mixture shall be designed for maximum permitted slump and air content. Each combination of material proposed for use shall have separate trial mixture, except for accelerator or retarder use can be provided without separate trial mixture. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39 for 7 and 28 days. From these results, a curve shall be plotted showing the relationship between water-cement ratio and strength for each set of trial mix studies. In addition a curve shall be plotted showing the relationship between 7 and 28-day strengths.

2.3.1.2 Required Average Strength of Mix Design

The selected mixture shall produce an average compressive strength exceeding the specified strength by the amount indicated in ACI 301. When a concrete production facility has a record of at least 15 consecutive tests, the standard deviation shall be calculated and the required average compressive strength shall be determined in accordance with ACI 301. When a concrete production facility does not have a suitable record of tests to establish a standard deviation, the required average strength shall be as follows:

A. For f'c between 3000 and 5000 psi, 1200 psi plus f'c.

2.4 MATERIALS

2.4.1 Cement

Cement shall comply with ASTM C 150, Type II.

2.4.1.1 Fly Ash

ASTM C 618, Type F, except that the maximum allowable loss on ignition shall be 6 percent. Add with cement.

2.4.2 Water

Water shall comply with the requirements of ASTM C 94 and the chloride and sulfate limits in accordance with ASTM D 512 and ASTM D 516. Mixing water shall not contain more than 500 parts per million of chlorides as Cl and not more than 100 parts per million of sulfates as

SO4. Water shall be free from injurious amounts of oils, acids, alkalies, salts, and organic materials. Where water from reprocessed concrete is proposed for use in the work, submit results of tests to verify that the treatment has negated adverse effects of deleterious materials.

2.4.3 Aggregates

ASTM C 33, except as modified herein. Furnish aggregates for exposed concrete surfaces from one source. Aggregates shall not contain any substance, which may be deleteriously reactive with the alkalies in the cement. Refer to appendix, paragraph entitled "Test Method C227" of ASTM C 33 for expansion limits. Provide aggregate containing no deleterious material properties as identified by ASTM C 295.

2.4.4 Nonshrink, Nonmetallic Grout

ASTM C 1107, salt and seawater resistant with a compressive strength of 8000 psi at 7 days in accordance with ASTM C 109 and a bond strength of 2000 psi per ASTM C 882.

2.4.5 Admixtures

ASTM C 494/C 494M: Type A, water reducing; Type B, retarding; Type C, accelerating; Type D, water-reducing and retarding; and Type E, water-reducing and accelerating admixture. Do not use calcium chloride admixtures.

Provide chemical admixtures that comply with the requirements shown below and in accordance with manufacturer's recommendations, and appropriate for the climatic conditions and the construction needs. Do not use calcium chloride or admixtures containing chlorides from other than impurities from admixture ingredients.

Provide minimum concentrations of corrosion-inducing chemicals as shown in table below.

Limits on Corrosion-Inducing Chemicals

| Chemical* | Limits, Percent** | Test Method |
|---|---|---|
| Chlorides | 0.10 | ASTM D 512 |
| Fluorides | 0.10 | ASTM D 1179 |
| Sulphites | 0.13 | ASTM D 1339 |
| Nitrates | 0.17 | ASTM D 3867 |

*Limits refer to water-soluble chemicals

**Limits are expressed as a percentage of the mass of the total cementitious materials.

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The total alkali content shall not increase the total sodium-oxide equivalent alkali content of the concrete by more than 0.5 lb/yd3.

2.4.5.1 Air-Entraining

Air Entraining Admixture: Provide air entraining admixtures conforming to ASTM C 260. Provide the admixture of such a type and dosage that the total air content in the hardened concrete can be readily maintained within the limits specified in table below.

| Air Content | | |
|---|---|---|
| Nominal maximum size of coarse aggregate, (inches) | Size Number | Total air content, percent by volume (percent) |
| 3/4 | 67 | 4-8 |
| 1 | 57 | 3.5-6.5 |

1. Accelerating: ASTM C 494, Type C.
2. Retarding: ASTM C 494, Type B, D, or G.
3. Water Reducing: ASTM C 494, Type A, E, or F.
4. High Range Water Reducer (HRWR) (Super-plasticizers): ASTM C 494, Type F and ASTM C 1017.

2.4.6 Materials for Curing Concrete

2.4.6.1 Impervious Sheeting

Impervious Sheeting shall conform to ASTM C 171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap.

2.4.6.2 Pervious Sheeting

Pervious Sheeting shall conform to AASHTO M182.

2.4.6.3 Liquid Membrane-Forming Compound

Liquid Membrane-Forming Compound shall conform to ASTM C 309, white-pigmented, Type 2, Class B.

2.4.7 Epoxy Bonding Compound

Epoxy Bonding Compound shall conform to ASTM C 881. Provide Type I for bonding hardened concrete to hardened concrete; Type II for bonding freshly mixed concrete to hardened concrete; and Type III as a binder in epoxy mortar or concrete, or for use in bonding skid-resistant materials to hardened concrete. Provide Grade 1 or 2 for horizontal surfaces and Grade 3 for vertical surfaces. Provide Class A if placement temperature is below 40 degrees F; Class B if placement temperature is between 40 and 60 degrees F; or Class C if placement temperature is above 60 degrees F.

2.5 REINFORCEMENT

2.5.1 Reinforcing Bars

ACI 301 unless otherwise specified. All reinforcement shall be epoxy-coated reinforcing steel bars, ASTM A 775/A 775M. ASTM A 615/A 615M and ASTM A 617/A 617M with the bars marked A, S, W, Grade 60; or ASTM A 616/A 616M with the bars marked R, Grade 60.

2.5.2 Mechanical Reinforcing Bar Connectors and Terminators

Reinforcing Bar Connectors and Terminators shall conform to ACI 301. Provide 125 percent minimum yield strength of the reinforcement bar.

2.5.3 Wire

ASTM A 82 or ASTM A 496.

2.5.4 Reinforcing Bar Supports

Provide bar ties and supports of coated or non-corrodible material.

## PART 3 - EXECUTION

3.1 FORMS

Forms shall be in accordance with ACI 301. Provide forms, shoring, and scaffolding for concrete placement. Set forms mortar-tight and true to line and grade. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch unless otherwise indicated. Provide formwork with clean-out openings to permit inspection and removal of debris. Forms submerged in water shall be watertight.

3.1.1 Coating

Before concrete placement, coat the contact surfaces of forms with a non-staining mineral oil, non-staining form coating compound, or two coats of nitrocellulose lacquer. Do not use mineral oil on forms for surfaces to which adhesive, paint, or other finish material is to be applied.

3.1.2 Removal of Forms and Supports

After placing concrete, forms shall remain in place for the time periods specified in ACI 347R. Prevent concrete damage during form removal.

3.1.2.1 Special Requirements for Reduced Time Period

Forms may be removed earlier than specified if ASTM C 39 test results of field-cured samples from a representative portion of the structure indicate that the concrete has reached a minimum of 85 percent of the design strength.

3.1.3 Re-shoring

Re-shore concrete elements where forms are removed prior to the specified time period. Do not permit elements to deflect or accept loads during form stripping or re-shoring. After forms are removed, slabs and beams over 10 feet in span and cantilevers over 4 feet shall be re-shored for the remainder of the specified time period in accordance with paragraph entitled “Removal of Forms and Support”, above. Perform re-shoring operations to prevent subjecting concrete members to overloads, eccentric loading, or reverse bending. Re-shoring elements shall have the same load-carrying capabilities as original shoring and shall be spaced similar to original shoring. Firmly secure and brace re-shoring elements to provide solid bearing and support.

## 3.2 FORMED SURFACES

### 3.2.1 Tolerances

Tolerances shall be in accordance with ACI 347R and as indicated.

### 3.2.2 As-Cast Form

Provide form facing material producing a smooth, hard, uniform texture on the concrete. Arrange facing material in an orderly and symmetrical manner and keep seams to a practical minimum. Support forms as necessary to meet required tolerances. Material with raised grain, torn surfaces, worn edges, patches, dents, or other defects, which will impair the texture of the concrete surface shall not be used.

## 3.3 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

Placing shall be in accordance with ACI 301. Provide bars, wire ties, supports, and other devices necessary to install and secure reinforcement. Reinforcement shall not have rust, scale, oil, grease, clay, or foreign substances that would reduce the bond. Rusting of reinforcement is a basis of rejection if the effective cross-sectional area or the nominal weight per unit length has been reduced. Remove loose rust prior to placing steel. Tack welding is prohibited.

### 3.3.1 Reinforcement Supports

Place reinforcement and secure with galvanized or non-corrodible chairs, spacers, or metal hangers. Epoxy-coated reinforcing bars supported from formwork shall rest on coated wire bar supports, or on bar supports made of dielectric material or other acceptable material. Wire bar supports shall be coated with dielectric material, compatible with concrete, for a minimum distance of 2 inches from the point of contact with the epoxy-coated reinforcing bars. Reinforcing bars used as support bars shall be epoxy coated. Spreader bars, where used, shall be epoxy coated. Proprietary combination bar clips and spreaders used in construction with epoxy-coated reinforcing bars shall be made corrosion resistant or coated with dielectric material. Epoxy-coated bars shall be tied with plastic-coated tie wire; or other materials acceptable to the Designer.

### 3.5.3 Epoxy Coated Reinforcing

Shall meet the requirements of A 775/A 775M including Appendix X1, "Guidelines for Job Site Practices" except as otherwise specified herein.

#### 3.5.3.1 Epoxy Coated Reinforcing Steel Placement and Coating Repair

Carefully handle and install bars to minimize job site patching. Use the same precautions as described in paragraph for reinforcement delivery, handling, and storage when placing coated reinforcement. Do not drag bars over other bars or over abrasive surfaces. Keep bar free of dirt and grit. When possible, assemble reinforcement as tied cages prior to final placement into the forms. Support assembled cages on padded supports. It is not expected that coated bars, when in final position ready for concrete placement, will be completely free of damaged areas; however, excessive nicks and scrapes which expose steel will be cause for rejection. Criteria for defects which require repair and for those that do not require repair are as indicated. Inspect for defects and provide required repairs prior to assembly. After assembly, reinspect and provide final repairs.

a. Immediately prior to application of the patching material, any rust and debonded coating shall be manually removed from the reinforcement by suitable techniques employing devices such as wire brushes and emery paper. Care shall be exercised during this surface preparation so that the damaged areas are not enlarged more than necessary to accomplish the repair. Damaged areas shall be clean of dirt, debris, oil, and similar materials prior to application of the patching material.

b. Repair and patching shall be done in accordance with the patching material manufacturer's recommendations. These recommendations, including cure times, shall be available at the job site at all times.

c. Allow adequate time for the patching materials to cure in accordance with the manufacturer's recommendation prior to concrete placement.

d. Rinse placed reinforcing bars with fresh water to remove chloride contamination prior to placing concrete.

3.3.2 Splicing

As indicated. For splices not indicated ACI 301. Do not splice at points of maximum stress. Overlap welded wire fabric the spacing of the cross wires, plus 2 inches. Welded splices shall be approved prior to use and shall conform to AWS D1.4.

3.3.3 Future Bonding

Plug exposed, threaded, mechanical reinforcement bar connectors with a greased bolt. Bolt threads shall match the connector. Countersink the connector in the concrete. Caulk the depression after the bolt is installed.

3.3.4 Cover

ACI 301 for minimum coverage, unless otherwise indicated.

3.3.5 Setting Miscellaneous Material

Place and secure all anchors and bolts, pipe sleeves, conduits, and other such items in position before concrete placement. Plumb anchor bolts and check location and elevation. Temporarily fill voids in sleeves with readily removable material to prevent the entry of concrete.

3.3.6 Construction Joints

Construction joints will not be permitted.

3.4 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE

Batching, measuring, mixing, and transporting concrete shall conform to ASTM C 94/C 94M, ACI 301, ACI 302.1R, and ACI 304R, except as modified herein. Batching equipment shall be such that the concrete ingredients are consistently measured within the following tolerances: 1 percent for cement and water, 2 percent for aggregate, and 3 percent for admixtures. Furnish mandatory batch ticket information for each load of ready mix concrete.

### 3.4.1 Measuring

Make measurements at intervals as specified in paragraphs entitled "Sampling" and "Testing", below.

### 3.4.2 Mixing

Mixing shall be in accordance with ASTM C 94/C 94M and ACI 301. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 85 degrees F except as follows: if set retarding admixture is used and slump requirements can be met, limit for placing concrete may remain at 90 minutes. Additional water may be added, provided that both the specified maximum slump and water-cement ratio are not exceeded. When additional water is added, an additional 30 revolutions of the mixer at mixing speed is required. If the entrained air content falls below the specified limit, add a sufficient quantity of admixture to bring the entrained air content within the specified limits. Dissolve admixtures in the mixing water and mix in the drum to uniformly distribute the admixture throughout the batch.

### 3.4.3 Transporting

Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete, which has segregated in transporting and dispose of as directed.

## 3.5 PLACING CONCRETE

Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris, water, snow, and ice from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete in one continuous operation from one end of the structure towards the other. Do not permit cold joints to occur.

### 3.5.1 Depositing Concrete under Water

Methods and equipment used shall prevent the washing of the cement from the mixture, minimize the formation of laitance, prevent the flow of water through the concrete before it has hardened, and minimize disturbance to the previously placed concrete. Do not deposit concrete in running water, seawater, or in water temperatures below 35 degrees F. Tremies, if used, shall be watertight and sufficiently large to permit a free flow of concrete. Keep the discharge end continuously submerged in fresh concrete. Keep the shaft full of concrete to a level well above the water surface. Discharge and spread the concrete by raising the tremie to maintain a uniform flow. Place concrete without interruption until the top of the fresh concrete is at the required height.

### 3.5.2 Vibration

Vibration shall be in accordance with ACI 301. Furnish a spare vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4 inches in depth with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by wood tampers, spading, and settling with a heavy leveling straightedge. Operate vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6000 impulses per minute when submerged. Do not use vibrators to transport the concrete in the forms. Insert and withdraw vibrators approximately 18 inches apart. Penetrate the previously placed lift with the vibrator when more than one lift is required. Place concrete in 18-inch maximum vertical lifts. External vibrators shall be used on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete.

### 3.5.3 Application of Epoxy Bonding Compound

Apply a thin coat of compound to dry, clean surfaces. Scrub compound into the surface with a stiff-bristle brush. Place concrete while compound is stringy. Do not permit compound to harden prior to concrete placement. Follow manufacturer's instructions regarding safety and health precautions when working with epoxy resins.

### 3.5.4 Pumping

Pumping shall be in accordance with ACI 304R and ACI 304.2R. Pumping shall not result in separation or loss of materials nor cause interruptions sufficient to permit loss of plasticity between successive increments. Loss of slump in pumping equipment shall not exceed 2 inches. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy. Rapid changes in pipe sizes shall be avoided. Maximum size of course aggregate shall be limited to 33 percent of the diameter of the pipe. Maximum size of well-rounded aggregate shall be limited to 40 percent of the pipe diameter. Samples for testing shall be taken at both the point of delivery to the pump and at the discharge end.

### 3.5.5 Cold Weather

Proceed in accordance with ACI 306.1. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval prior to placing concrete when the ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Limit the rate of cooling to 5 degrees F in any 1 hour and 50 degrees F per 24 hours after heat application.

### 3.5.6 Hot Weather

Proceed in accordance with ACI 305R. Maintain required concrete temperature using Figure 2.1.5 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane

curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

## 3.6 FLOOR, SLAB, AND PAVEMENT FINISHES AND MISCELLANEOUS CONSTRUCTION

ACI 302.1R, unless otherwise specified.

### 3.6.1 Finish

Place, consolidate, and immediately strike off concrete to obtain proper contour, grade, and elevation before bleed-water appears. Permit concrete to attain a set sufficient for floating and supporting the weight of the finisher and equipment. If bleed-water is present prior to floating the surface, drag the excess water off or remove by absorption with porous materials. Do not use dry cement to absorb bleed-water.

#### 3.6.1.1 Steel Troweled

Use for walking surfaces. First, provide a floated finish. The finish shall next be power troweled three times, and finally hand troweled. The first troweling after floating shall produce a smooth surface, which is relatively free of defects but which may still show some trowel marks. Additional trowelings shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated by the hand troweling operations. The finished surface shall be essentially free of trowel marks and uniform in texture and appearance. The finished surface shall produce a surface level to within 1/4 inch in 10 feet.

## 3.7 CURING AND PROTECTION

ACI 301 unless otherwise specified. Begin curing immediately following form removal. Avoid damage to concrete from vibration created by pile driving, movement of equipment in the vicinity, disturbance of formwork or protruding reinforcement, and any other activity resulting in vibrations. Protect concrete from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. Do not use membrane-forming compound on surfaces where appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or on concrete to which other concrete is to be bonded. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period.

### 3.7.1 Moist Curing

Remove water without erosion or damage to the structure.

#### 3.7.1.1 Ponding or Immersion

Continually immerse the concrete throughout the curing period. Water shall not be more than 20 degrees F less than the temperature of the concrete. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

3.7.1.2 Fog Spraying or Sprinkling

Apply water uniformly and continuously throughout the curing period. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

3.7.1.3 Pervious Sheeting

Completely cover surface and edges of the concrete with two thicknesses of wet sheeting. Overlap the sheeting 6 inches over adjacent sheeting. Sheeting shall be at least as long as the width of the surface to be cured. During application, do not drag the sheeting over the finished concrete nor over sheeting already placed. Wet sheeting thoroughly and keep continuously wet throughout the curing period.

3.7.1.4 Impervious Sheeting

Wet the entire exposed surface of the concrete thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edges and transverse laps to form closed joints. Repair torn or damaged sheeting or provide new sheeting. Cover or wrap columns, walls, and other vertical structural elements from the top down with impervious sheeting; overlap and continuously tape sheeting joints; and introduce sufficient water to soak the entire surface prior to completely enclosing.

3.7.2 Liquid Membrane-Forming Curing Compound

Seal or cover joint openings prior to application of curing compound. Prevent curing compound from entering the joint. Apply in accordance with the recommendations of the manufacturer immediately after any water sheen, which may develop after finishing has disappeared from the concrete surface. Provide and maintain compound on the concrete surface throughout the curing period. Do not use this method of curing where the use of Figure 2.1.5 in ACI 305R indicates that hot weather conditions will cause an evaporation rate exceeding 0.2 pound of water per square foot per hour.

3.7.2.1 Application

Unless the manufacturer recommends otherwise, apply compound immediately after the surface loses its water sheen and has a dull appearance. Mechanically agitate curing compound thoroughly during use. Use approved power-spraying equipment to uniformly apply two coats of compound in a continuous operation. The total coverage for the two coats shall be 200 square feet maximum per gallon of undiluted compound unless otherwise recommended by the manufacturer's written instructions. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel. Immediately apply an additional coat of compound to areas where the film is defective. Re-spray concrete surfaces subjected to rainfall within 3 hours after the curing compound application.

3.7.2.2 Protection of Treated Surfaces

Prohibit pedestrian and vehicular traffic and other sources of abrasion at least 72 hours after compound application. Maintain continuity of the coating for the entire curing period and immediately repair any damage.

3.7.3 Curing Periods

ACI 301, except 21 days for concrete that will be in full-time or intermittent contact with seawater, salt spray, alkali soil or waters. Begin curing immediately after placement. Protect concrete from premature drying, excessively hot temperatures, and mechanical injury; and maintain minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing shall be subject to approval by the Designer.

3.8 FIELD QUALITY CONTROL

An independent testing agency will be selected and paid for by the Owner. The Contractor shall be responsible for the scheduling and coordination of the work performed by the testing laboratory.

3.8.1 Sampling

Sampling shall be in accordance with ASTM C 172. Collect samples of fresh concrete to perform tests specified. Refer to ASTM C 31/C 31M for making test specimens.

3.8.2 Testing

3.8.2.1 Slump Tests

Slump Tests shall conform to ASTM C 143/C 143M. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete.

3.8.2.2 Temperature Tests

Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

3.8.2.3 Compressive Strength Tests

Compressive Strength Tests shall conform to ASTM C 39. Make five test cylinders for each set of tests in accordance with ASTM C 31/C 31M. Precautions shall be taken to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Samples for strength tests of each mix design of and for concrete placed each day shall be taken not less than once a day, nor less than once for each 100 cubic yards of concrete. For the entire project, take no less than five sets of samples and perform strength tests for each mix design of concrete placed. Each strength test result shall be the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than f'c, or if any strength test result falls below f'c by more than 500 psi, take a minimum of three ASTM C 42 core samples from the in-place work represented by the low test cylinder results and test. Concrete represented by core test shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of f'c and if no single core is less than 75 percent of f'c. Locations represented by erratic core strengths shall be retested. Remove concrete not

meeting strength criteria and provide new acceptable concrete. Repair core holes with non-shrink grout. Match color and finish of adjacent concrete.

3.8.2.4 Air Content

Air Content shall conform to ASTM C 173/C 173M or ASTM C 231 for normal weight concrete. Test air-entrained concrete for air content at the same frequency as specified for slump tests.

## PART 4 – COMPENSATION

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 03410

# PRECAST STRUCTURAL CONCRETE

## PART 1 – GENERAL

1.1 DESCRIPTION

A. The work to be performed under this Section shall consist of furnishing labor, materials, equipment, and services necessary to in the performance of operations in connection with installation of the precast structural concrete as specified in this Section and as indicated on the Contract Drawings.

B. Related work specified elsewhere.

Section 03300 – Cast-in-Place Concrete

1.2 REFERENCE STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ACI INTERNATIONAL (ACI)

| | |
|---|---|
| ACI 304R | (2000) Measuring, Mixing, Transporting, and Placing Concrete |
| ACI 305.1 | (2006) Hot Weather Concreting |
| ACI 306.1 | (1990) Cold Weather Concreting |
| ACI 309R | (2005) Consolidation of Concrete |
| ACI 318 | (2008) Building Code Requirements for Structural Concrete |

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM A 27/A 27M | (2008) Steel Castings, Carbon, for General Application |
| ASTM A 36/A 36M | (2008) Carbon Structural Steel |
| ASTM A 47-99 | (2004) Ferritic Malleable Iron Castings |
| ASTM A 123/A 123M | (2008) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products |
| ASTM A 153/A 153M | (2005) Zinc Coating (Hot-Dip) on Iron and Steel Hardware |
| ASTM A 185 | (2007) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement |

| | |
|---|---|
| ASTM A 307 | (2007b) Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength |
| ASTM A 325 | (2009) Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength |
| ASTM A 497 | (2007) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement |
| ASTM A 563 | (2007a) Carbon and Alloy Steel Nuts |
| ASTM A 780 | (2001) Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings |
| ASTM C 33 | (2008) Concrete Aggregates |
| ASTM C 94 | (2009) Ready-Mixed Concrete |
| ASTM C 150 | (2007) Portland Cement |
| ASTM C 260 | (2006) Air-Entraining Admixtures for Concrete |
| ASTM C 494 | (2008a) Chemical Admixtures for Concrete |
| ASTM C 595 | (2008a) Blended Hydraulic Cements |
| ASTM C 618 | (2008a) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete |
| ASTM C 989 | (2009) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars |
| ASTM C 1107 | (2008) Packaged Dry, Hydraulic-Cement Grout (Nonshrink) |
| ASTM F 436 | (2009) Hardened Steel Washers |
| ASTM F 844 | (2007a) Washers, Steel, Plain (Flat), Unhardened for General Use |

AMERICAN WELDING SOCIETY (AWS)

| | |
|---|---|
| AWS D1.4 | (2005) Structural Welding Code - Reinforcing Steel |

PRECAST/PRESTRESSED CONCRETE INSTITUTE (PCI)

| | |
|---|---|
| PCI MNL-116 | (1999) Quality Control for Plants and Production of Structural Precast Prestressed Concrete Products |
| PCI MNL-120 | (2004) Design Handbook - Precast and Prestressed Concrete |

1.3 PRECAST MEMBERS

A. The work includes the provision of precast non-prestressed concrete herein referred to as precast members. Precast members shall be the product of a manufacturer specializing in the production of precast concrete members. In the ACI publications, the advisory provisions shall be considered to be mandatory, as though the word "shall" has been substituted for "should" wherever it appears; reference to the "Building Official" the "Structural Engineer" and the "Architect/Engineer" shall be interpreted to mean the CE.

1.4 SUBMITTALS

A. The following shall be submitted in accordance with the General Conditions of the Contract.

1. Drawings of precast members

2. Anchorage and lifting inserts and devices

3. Concrete mix design.

4. Contractor-Furnished Mix Design: Submit copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the job conditions. Obtain approval before concrete placement.

5. Fabrication: Submit quality control procedures established in accordance with PCI MNL-116 by the precast manufacturer.

6. Calculations as described in paragraph 1.8 of this section.

B. Closeout Submittals: Concrete batch ticket information

1.5 QUALITY CONTROL

A. PCI Quality Certifications: PCI MNL-116. At the precast manufacturer's option, in lieu of core samples, ACI 318/318M, full-scale load tests may be performed. Perform on randomly selected members, as directed by the Engineer.

1. Product Quality Control: PCI MNL-116 for PCI enrolled plants. Where panels are manufactured by specialists in plants not currently enrolled in the PCI "Quality Control Program," provide a product quality control system in accordance with PCI MNL-116 and perform concrete and aggregate quality control testing using an approved, independent commercial testing laboratory. Submit test results to the Engineer.

or

2. Product Quality Control: Plants shall be certified by the PCI Plant Certification Program for Category C2, C3, or C4 work.

1.6 DELIVERY AND STORAGE

A. Lift and support precast members at the lifting and supporting points indicated on the shop drawings. Store precast members off the ground. Separate stacked precast members by battens across the full width of each bearing point. Protect from weather, marring, damage, and overload.

1.7 FACTORY INSPECTION

A. At the option of the Owner, precast units may be inspected by the Owner's Representative prior to being transported to the job site. The Contractor shall give notice 14 days prior to the time the units will be available for plant inspection. Neither the exercise nor waiver of inspection at the plant will affect the Owner's right to enforce contractual provisions after units are transported or erected.

1.8 QUALITY ASSURANCE

A. Drawing Information: Submit drawings indicating complete information for the fabrication, handling, and erection of the precast member. Drawings shall not be reproductions of contract drawings. Design calculations and drawings of precast members (including connections) shall be prepared and sealed by a Virginia registered professional engineer, and submitted for approval prior to fabrication. The drawings shall indicate, as a minimum, the following information:

1. Marking of members for erection

2. Connections for work of other trades

3. Connections between members, and connections between members and other construction

4. Location and size of openings

5. Joints between members, and joints between members and other construction

6. Reinforcing details

7. Material properties of steel and concrete used

8. Lifting and erection inserts

9. Dimensions and surface finishes of each member

10. Erection sequence and handling requirements

11. All calculations pertaining to final product dimensions and reinforcement which differ from the contract plans, lifting devices and any appurtenances that are not shown in the contract plans.

12. All loads used in design (such as live, dead, handling, and erection)

13. Bracing/shoring required

14. Areas to receive toppings, topping thickness.

B. Concrete Mix Design: Thirty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Include a complete list of materials including type; brand; source and amount of cement, pozzolan, and admixtures; and applicable reference specifications.

C. Certificates: Record Requirement: ASTM C 94. Submit mandatory batch ticket information for each load of ready-mixed concrete.

**PART 2 – PRODUCTS**

2.1 CONTRACTOR-FURNISHED MIX DESIGN

A. ACI 318/318M. The minimum compressive strength of concrete at 28 days shall be 4,000 psi unless otherwise indicated. Add air-entraining admixtures at the mixer to produce between 4 and 6 percent air by volume. Water/cement ratio shall be 0.40 by weight.

2.2 MATERIALS

A. All materials described herein shall comply with VDOT Road and Bridge Specifications and the specifications described below.

B. Cement: ASTM C 150, Type II; or ASTM C 595 Type IP(MS) or IS(MS) blended cement, except as modified herein. The blended cement shall consist of a mixture of ASTM C 150 cement and one of the following materials: ASTM C 618 pozzolan or fly ash, or ASTM C 989 ground iron blast furnace slag. The pozzolan/fly ash content shall not exceed 25 percent by weight of the total cementitious material. For exposed concrete, use one manufacturer for each type of cement, ground slag, fly ash, and pozzolan.

1. Fly Ash and Pozzolan: ASTM C 618, Type N, F, or C, except that the maximum allowable loss on ignition shall be 6 percent for Type N and F.

   a. Ground Iron Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

2. Water: Water shall be fresh, clean, and potable.

3. Aggregates: ASTM C 33, Size 57, except as modified herein. Obtain aggregates for exposed concrete surfaces from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalies in the cement.

4. Grout: Nonshrink Grout: ASTM C 1107.

5. Admixtures

   a. Air-Entraining: ASTM C 260

b. Accelerating: ASTM C 494, Type C or E

c. Water Reducing: ASTM C 494, Type A, E, or F

6. Epoxy Coated Reinforcement

a. Provide as indicated and specified in Section 03300.

7. Metal Accessories: Provide ASTM A 123/A 123M or ASTM A 153/A 153M galvanized unless otherwise indicated.

a. Inserts: ASTM A 47, Grade 32510 or 35018, or ASTM A 27/A 27M Grade U-60-30

b. Structural Steel: ASTM A 36/A 36M

c. Bolts: ASTM A 307; ASTM A 325

d. Nuts: ASTM A 563

e. Washers: ASTM F 844 washers for ASTM A 307 bolts, and ASTM F 436 washers for ASTM A 325 bolts

## 2.3 FABRICATION

A. PCI MNL-116 unless specified otherwise.

1. Forms: Brace forms to prevent deformation. Forms shall produce a smooth, dense surface. Chamfer exposed edges 0.75-inch, unless otherwise indicated. Provide threaded or snap-off type form ties.

2. Reinforcement Placement: ACI 318/318M for placement and splicing. Reinforcement may be preassembled before placement in forms. Provide exposed connecting bars, or other approved connection methods, between precast and cast-in-place construction. Remove any excess mortar that adheres to the exposed connections.

3. Concrete

a. Concrete Mixing: ASTM C 94. Mixing operations shall produce batch-to-batch uniformity of strength, consistency, and appearance.

b. Concrete Placing: ACI 304R, ACI 305R for hot weather concreting, ACI 306.1 for cold weather concreting, and ACI 309R, unless otherwise specified.

c. Concrete Curing: Commence curing immediately following the initial set and completion of surface finishing. Provide curing procedures to keep the temperature of the concrete between 50 and 190 degrees F. When accelerated curing is used, apply heat at controlled rate and uniformly along the casting beds. Monitor temperatures at various points in a product line in different casts.

4. Surface Finish: Repairs located in a bearing area shall be approved by the Engineer prior to repairs. Precast members containing hairline cracks which are visible and are less than 0.2 inches in width, may be accepted, except that cracks larger than 0.05 inches in width for surfaces exposed to the weather shall be repaired. Precast members which contain cracks greater than 0.2 inches in width shall be approved by the Engineer, prior to being repaired. Any precast member that is structurally impaired or contains honeycombed section deep enough to expose reinforcing shall be rejected.

a. Unformed Surfaces: Provide a floated finish.

b. Formed Surfaces: PCI MNL-116 (Appendix A - Commentary), Chapter 3, for grades of surface finishes.

(1) Unexposed Surfaces: Provide a standard grade surface finish.

(2) Exposed Surfaces: Provide a standard grade surface finish. The combined area of acceptable defective areas shall not exceed 2 percent of the exposed to view surface area, and the patches shall be indistinguishable from the surrounding surfaces when dry.

## PART 3 – EXECUTION

### 3.1 SURFACE REPAIR

A. Prior to erection, and again after installation, precast members shall be checked for damage, such as cracking, spalling, and honeycombing. As directed by the Owner, precast members that do not meet the surface finish requirements specified in Paragraph 2.3, Item 4, “Surface Finish”, shall be repaired or removed and replaced with new precast members.

### 3.2 ERECTION

A. Precast members shall be erected after the concrete has attained the specified compressive strength, unless otherwise approved by the precast manufacturer. Erect in accordance with the approved shop drawings. Follow PCI MNL-116 and PCI MNL-120 (Chapter 8), for tolerances. Brace precast members, unless design calculations submitted with the shop drawings indicate bracing is not required. Follow the manufacturer's recommendations for maximum construction loads. Place precast members level, plumb, square, and true within tolerances. Align member ends.

### 3.3 BEARING SURFACES

A. Shall be flat and free of irregularities. Correct bearing surface irregularities with nonshrink grout. Place precast members at right angles to the bearing surface, unless indicated otherwise, and draw-up tight without forcing or distortion, with sides plumb.

3.4 ANCHORAGE

A. Provide anchorage for fastening work in place. Conceal fasteners where practicable. Make threaded connections up tight and nick threads to prevent loosening.

3.5 WELDING

A. AWS D1.4 for welding connections and reinforcing splices. Protect the concrete and other reinforcing from heat during welding. Weld continuously along the entire area of contact. Grind smooth visible welds in the finished installation. Welding of epoxy-coated reinforcing is not allowed.

3.6 OPENINGS

A. Holes or cuts requiring reinforcing to be cut, which are not indicated on the approved shop drawing, shall only be made with the approval of the Engineer and the precast manufacturer. Drill holes less than 12 inches in diameter with a diamond tipped core drill.

3.7 GALVANIZING REPAIR

A. Repair damage to galvanized coatings using ASTM A 780 zinc rich paint for galvanized surfaces damaged by handling, transporting, cutting, welding, bolting, or acid washing. Do not heat surfaces to which repair paint has been applied.

3.8 GROUTING

A. Clean and fill indicated keyways between precast members, and other indicated areas, solidly with nonshrink grout or cementitious grout. Provide reinforcing where indicated. Remove excess grout before hardening.

**PART 4 – COMPENSATION**

4.1 BASIS OF PAYMENT

A. Payment for work described in this Section and shown on the Contract Drawings, including all labor, materials, services and equipment necessary to complete the work to the satisfaction of the Owner, shall be compensated in accordance with Specification Section 01270 Measurement and Payments.

**END OF SECTION**

# SECTION 09970

# COATING OF STEEL SHEET PILE STRUCTURES

## PART 1 – GENERAL

### 1.1 DESCRIPTION

A. The work covered by this Section includes the furnishing of all materials and equipment and the performing of all labor to complete application of corrosion protection coatings for steel sheet pile structures as shown on the Contract Drawings and as herein specified or directed by the Engineer.

### 1.2 RELATED SECTIONS

A. Section 02464 Steel Sheet Piling

### 1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

B. Unless otherwise indicated the most recent edition of the publication, including any revisions, shall be used.

C. American Institute of Steel Construction, Inc. (AISC)

AISC SPE Sophisticated Paint Endorsement

D. American Society for Testing and Materials (ASTM)

ASTM D 1186 (2005) Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base
ASTM E 376 (2006) Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods

E. National Association of Corrosion Engineers (NACE)

NACE RP0188 (1999) Discontinuity (Holiday) Testing of Protective Coatings on Conductive Substrates

F. Steel Structures Painting Council (SSPC)

SSPC-PS 11.01 (2004) Black (or Dark Red) Coal Tar Epoxy-Polyamide Painting System
SSPC-QP 3 (2004) Shop Painting Certification Program
SSPC-SP 1 (2004) Solvent Cleaning
SSPC-SP 10 (2004) Near-White Blast Cleaning
SSPC-Paint 16 (2004) Coal Tar Epoxy-Polyamide Black (or Dark Red) Paint

1.4 SUBMITTALS

A. Submit the following in accordance with Section 01330, “Submittals” of these Specifications.

B. Coating Materials

1. Manufacturer’s data.
2. Manufacturer’s application instructions.

C. Quality Control Procedures

1. Submit proposed application standards and quality control procedures.
2. Current AISC SPE or SSPC-QP 3 Certification.

D. Coating Inspection Reports

1. Dry film thickness measurements.
2. Holiday test results.

E. Coating Repair Procedures

F. Qualifications

1. Shop coating contractor.
2. Shop coating inspector.
3. Third-party coating inspector.

1.5 QUALITY ASSURANCE

A. Shop coating contractor shall possess a current SSPC-QP 3 or AISC SPE Certification.

B. Coating Control: Application of coating in the shop and in the field will be done under the supervision of an experienced coating inspector. Low voltage electrical inspection of sheet piling shall be performed prior to installation by a third-party inspector experienced in holiday testing of coatings.

1.6 ENVIRONMENTAL CONDITIONS

A. Start work only when ambient and curing temperatures and humidity are within limits of coating manufacturer's recommendations and at least 5 degrees F above dew point temperature.

1.7 HEALTH AND SAFETY PRECAUTIONS

A. Materials listed in this section contain coal tar pitch volatiles, which are toxic. Follow safety procedures as recommended by manufacturer. Work in a well ventilated area. Provide, and require workers to use, impervious clothing, gloves, face shields (8-inch minimum), and other appropriate protective clothing necessary to prevent eye and

skin contact with coating materials. Keep coatings away from heat, sparks and flame.

## PART 2 – PRODUCTS

2.1 COATING SYSTEM

A. Coal Tar Epoxy-Polyamide Coating
   1. System: SSPC-PS 11.01
   2. Paint: SSPC-Paint 16 Black

## PART 3 – EXECUTION

3.1 CLEANING AND PREPARATION OF SURFACES

A. Solvent Cleaning: SSPC-SP 1. Remove visible oil, grease, and drawing and cutting compounds by solvent cleaning.

B. Blast Cleaning: SSPC-SP 10. After solvent cleaning, complete surface preparation by near-white blast cleaning. Remove residual dust from blasted surface by blowing with dry, oil-free air, vacuuming, or sweeping. Provide surface profile of at least 2 1/2-mil thickness.

C. Additional Preparation: SSPC-SP 10. After blast cleaning surface imperfections that remain shall be removed as necessary to provide for a holiday free coating.

D. After blast cleaning and any additional preparation, remove visible oil, grease, and drawing and cutting compounds by solvent cleaning.

3.2 PROPORTIONING AND MIXING OF COATING SYSTEM

A. Proportioning of Coal Tar Epoxy-Polyamide System: Coal tar epoxy-polyamide consists of a two-component system. Component A contains a refined coal tar pitch, polyamide resin, and a polyamine promoter to accelerate curing rate. Component B is an epoxy resin. Mix both components in a ratio of 4 parts of Component A to 1 part of Component B by volume. Do not thin coatings when doing so will result in total volatile organic compounds exceeding limits enacted by local air pollution control districts. When thinning is allowed and is necessary for proper application, use xylene or the coating manufacturer's recommended thinner, to a maximum of 1/2 gallon to a 5-gallon batch.

B. Mixing of Coal Tar Epoxy-Polyamide System: Power stir components to a smooth, uniform consistency. Stir coating periodically during induction period. Follow coating manufacturer's requirements for induction time and pot life of mixed batches.

## 3.3 COATING APPLICATION

A. General: Apply primer coating to dry surfaces not more than four (4) hours after near-white blast cleaning. Apply coats of each system so that finished surfaces are free from runs, sags, brush marks and variations in color.
   1. Application Method for Coal Tar Epoxy-Polyamide System: Unless otherwise specified by manufacturer's recommendations, do not allow drying time between coats to exceed 72 hours. Under conditions of direct sunlight or elevated ambient temperatures of 90 degrees F or greater, limit intercoat drying period to a maximum of 24 hours.

B. Repair of Defects: Repair detected coating holidays, thin areas, and exposed areas damaged prior to or during installation by surface treatment and application of additional coating or by manufacturer's recommendations. Allow a period of at least 72 hours to pass following final coat before placing in immersion service.

C. Coal Tar Epoxy-Polyamide System: Apply a minimum of two (2) coats, each coat at a dry film thickness of not less than 8 mils.

D. Dry Film Thickness: Provide total system minimum dry film thickness of 16 mils. Measure using a magnetic gage.

## 3.4 SURFACES TO BE COATED

A. Steel Waterfront Construction
   1. Steel Sheet Piling: Top 20-feet of waterside face of sheet piling.

## 3.5 FIELD TESTING

A. Provide a minimum of 48 hours advance notice to the Engineer of field testing.

B. Conduct the following in the presence of the Engineer:

   1. Holiday Testing: Prior to installation, test 100% of coated surfaces for holidays in total coating system in accordance with NACE RP0188. All piling shall be holiday-free immediately prior to installation.
   2. Dry Film Thickness: After repair of holidays, measure coating thickness for all coated piling with a magnetic-type dry film thickness gage in accordance with ASTM D 1186 and ASTM E 376. If any region of piling has insufficient coating thickness or holidays, the coating on that region shall be repaired with an approved coal tar epoxy product. Re-measure after an additional coat is applied, if required to meet minimum coating thickness requirements.

C. Submit report of coating test results. Note defective areas and corrective measures taken.

D. Field touch up all damaged surfaces following manufacturer’s instructions.

## PART 4 – COMPENSATION

4.1 MEASUREMENT

A. Coating of Steel Waterfront Structures shall not be measured.

4.2 PAYMENT

A. Payment for Coating of Steel Waterfront Structures, complete in place, shall be taken to be included in and covered by the Unit Price for Sheetpile Bulkhead.

B. The above prices shall include all the work described in this Section and shown on the Contract Drawings including all labor, materials, services, and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

END OF SECTION

# APPENDIX A

# REPORT OF GEOTECHNICAL EXPLORATION

## Jamestown Crescent Culvert Replacement Norfolk, Virginia

*prepared for*
Moffatt & Nichol
Norfolk, Virginia

April 22, 2010

GER GeoEnvironmental Resources, Inc.
Consulting Engineers
Environmental • Groundwater • Hazardous Materials • Geotechnical • Industrial Hygiene

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Consulting Engineers
Environmental • Groundwater • Hazardous Materials • Geotechnical • Industrial Hygiene

Thursday, April 22, 2010

**Moffatt & Nichol**
800 World Trade Center
Norfolk, Virginia 23510

Attention: **Mr. Jousha Hill, P.E.**

Subject: **Report of Geotechnical Exploration**
Jamestown Crescent Culvert Replacement
Norfolk, Virginia
M & N Project No. 6207-20
**GER** Project No. 110-5377

**G**eo**E**nvironmental **R**esources, Inc. is pleased to present this report of geotechnical exploration for the above referenced project. Our services were performed in accordance with the subconsultant agreement between Moffatt & Nichol and GER dated March 15, 2010.

We appreciate the opportunity to serve as your geotechnical consultant on this project and trust that you will contact us at your convenience with any questions concerning this report or the project in general.

Sincerely,
**G**eo**E**nvironmental **R**esources, Inc.

COMMONWEALTH OF VIRGINIA
Charles F. P. Crawley, III, P.E.
2010.04.22 17:17:24 -04'00'
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Lic. No. 028607
PROFESSIONAL ENGINEER

Charles F. P. Crawley, III, P.E.
Assistant Vice President

# EXECUTIVE SUMMARY

The subsurface conditions were explored by two SPT soil borings performed to a depth of 75 feet below the existing ground surface. The borings were performed on land at green areas near opposing ends of the existing culvert.

The subsurface conditions encountered in the borings were composed of six general stratigraphic layers that consisted of uncontrolled fill and deep alluvial sediments composed of interlayered very loose to firm sands and very soft to firm clays. The deep alluvial sediments overlie firm sands of the Norfolk Formation.

The groundwater table was encountered in the test borings at a depth of about 3.5 feet below the existing ground surface at the time of exploration. Groundwater and free water levels will be tidally influenced at the site.

Based on the results of the test borings, we expect that the replacement culvert can be soil supported in the native sands or approved fill material above the soft clay strata. Use of a crushed stone bedding layer over geotextile fabric is recommended to facilitate support of the culvert.

Tolerable post-construction settlements are estimated for the replacement culvert provided that there is minimal net stress increase associated with the new construction. Estimated total settlements for various net stress increases are provided.

Some of the excavated materials which are kept free of clay, organics and debris are expected to be suitable for reuse as backfill on the project based on laboratory test results.

Constructing the replacement culvert in the dry is recommended to allow verification of subgrade conditions. This is expected to require a cofferdam and extensive dewatering efforts.

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APPENDICES

APPENDIX A - Drawings

APPENDIX B - Field Test Data

APPENDIX C - Laboratory Test Data

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# Purpose of Exploration

The purpose of this exploration was to collect geotechnical data near the proposed culvert replacement site. Geotechnical recommendations for design and construction of the replacement culvert are provided based on analysis of the field and laboratory data obtained.

# Project Information

The proposed project will replace the existing culvert on Jamestown Crescent near the intersection of Bolling Avenue and the bridge on Colley Avenue in Norfolk, Virginia. A site location map is shown in Figure 1 and Drawing 1 in Appendix A. The existing structure is a deteriorated reinforced concrete box culvert with wing walls that connects the Lafayette River to a tidal lagoon. The existing culvert is approximately 4 feet square. Its current method of foundation support is unknown at this time. A like kind replacement is expected. We understand that minimal site grade increases will be performed.

# Site Description

The existing box culvert appears to be founded directly below the pavement on Jamestown Crescent. Its orientation relative to the roadway is skewed in the northwest-southeast direction. A tidal lagoon is present at the northwest end of the culvert and a tidal stream that connects to the Lafayette River is located at the southeast end. Grass shoulders, trees, curbs, sidewalks and residential property are present at the site. Ground elevations of the pavements and shoulders are on the order of 4 feet (NAVD88) based on information obtained from the surveyor. Mudline elevations at the ends of the culvert are estimated at about -1 to -2 feet. A normal tidal range on the order of 2.5 feet is estimated for the site.

# Exploration Program

The subsurface exploration program consisted of performing 2 standard penetration test (SPT) soil borings to a depth of 75 feet below the existing ground surface. Borings were located in the shoulders on opposing sides of Jamestown Crescent and within approximately 30 feet of the ends of the existing culvert. The testing locations and depths were selected by **GER**. The approximate test locations are shown in Figure 2 and Drawing 2 in Appendix A. The test locations

**Figure 1.** *Site Location*

**Figure 2.** *Test Boring Locations*

were selected based on accessibility constraints associated with overhead and underground utilities and other physical features. Field test results are provided in Appendix B. Laboratory test results of natural moisture content, soil classification and consolidation testing are included in Appendix C. Exploration and sampling procedures are included in Appendix D.

# Subsurface Conditions

The subsurface conditions encountered at the boring locations are shown on the test boring records in Appendix B. The test boring records represent our interpretation of the subsurface conditions based on visual examination of field samples obtained and laboratory classification testing on selected samples. The lines designating

the interface between various strata on the boring records represent the approximate interface location. In addition, the transition between strata may be gradual. Water levels shown on the boring records represent the conditions only at the time of the field exploration. Elevations shown on the boring records shall be considered approximate.

Standard penetration tests were conducted in the borings at discreet intervals in general accordance with ASTM D 1586. Small disturbed samples were obtained during the test and were used to classify the soil. The resistances also provide a general indication of soil strength and compressibility. A summary of the penetration resistance profile is shown in Figure 3.

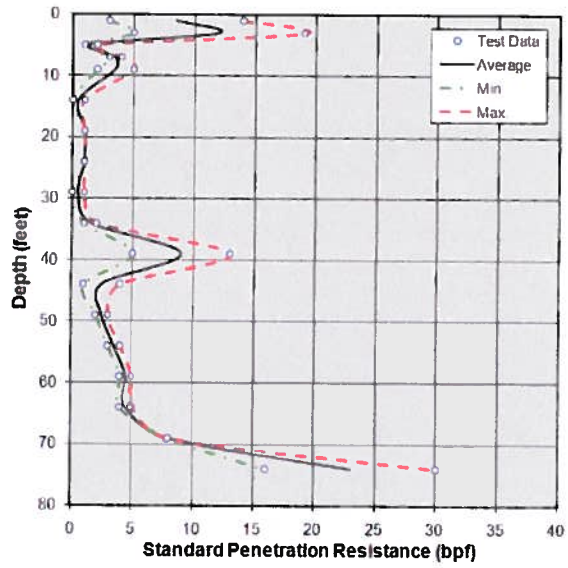



**Figure 3.** *SPT Resistance Profile*

## ***Soil Stratigraphy***

Subsurface conditions encountered in the borings were composed of six general stratigraphic layers as described below and shown in Figure 4 and Drawing 3 in Appendix A. Variations between the estimated profile and the actual subsurface site conditions can be expected.

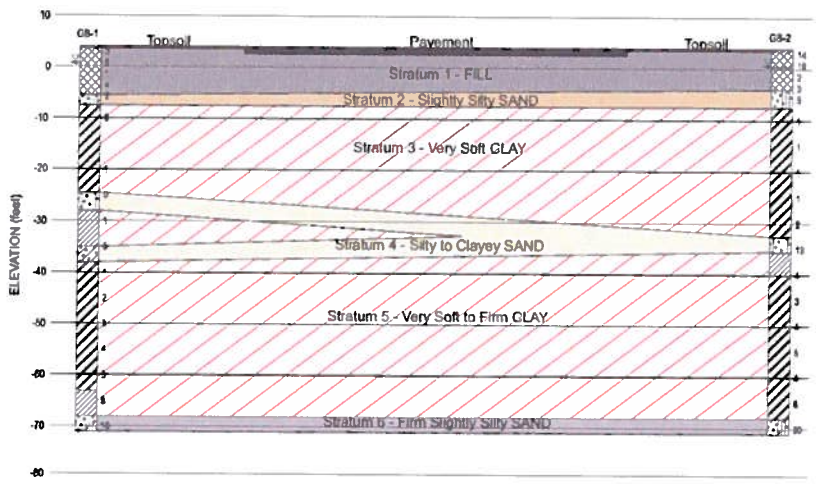



**Figure 4.** *Estimated Subsurface Profile*

**STRATUM 1** was composed of uncontrolled FILL. It was sampled as very loose to firm clayey to silty sand with traces of clay, organics, gravel, shells, brick and wood. It extended from beneath the surface topsoil to a depth of about 8 to 9 feet below the ground surface at the boring locations. SPT N-values ranged from 1 to 19 blows per foot (bpf) and averaged 6 bpf in these soils. Strength and density properties of this layer will be variable.

**STRATUM 2** was composed of very loose to loose, fine to medium, slightly silty SAND (SP-SM). It was encountered from below Stratum 1 to a depth of about 11 to 12 feet below the ground surface at the boring locations. SPT N-values ranged from 2 to 5 bpf in these soils. Angle of internal friction is estimated to range from about 29° to 30° for this layer. It is assumed to be cohesionless.

**STRATUM 3** was composed of very soft, silty, low to high plasticity CLAY (CL, CH) with traces of sand, shell fragments and organics. It was encountered from below Stratum 2 to a depth of about 29 to 36 feet below the ground surface at the boring locations. SPT resistances ranged from 0 (weight of hammer) to 2 bpf in these soils. Undrained shear strength for this layer is estimated at 150 to 450 psf from empirical correlations to SPT and laboratory test results.

**STRATUM 4** was composed of very loose to firm, fine, silty and clayey SAND (SM, SC). It was encountered below and interlayered with Stratum 3 and extended to a depth of about 39 to 42 feet below the ground surface. SPT N-values ranged

from 0 to 13 bpf and averaged 6 bpf in these soils. Angle of internal friction is estimated to range from 28° to 31° for this layer. It is assumed to be predominantly cohesionless.

**STRATUM 5** was composed of very soft to firm, silty, low to high plasticity CLAY (CL, CH) with traces of sand and shell fragments. It was encountered from below Stratum 4 to a depth of about 72 feet below the ground surface at the boring locations. SPT resistances ranged from 1 to 8 bpf in these soils with an average of about 4 bpf. Undrained shear strength for this layer is estimated at 150 to more than 1,000 psf from empirical correlations to SPT and laboratory test results.

**STRATUM 6** was composed of firm, fine to medium, slightly silty SAND (SP-SM) with trace clay. It was encountered from below Stratum 5 to the maximum depth of the exploration of 75 feet. This stratum is known as the Norfolk Formation. SPT N-values ranged from 16 to 30 bpf in these soils. Angle of internal friction is estimated to range from about 33° to 36° for this layer. It is assumed to be cohesionless.

### *Groundwater*

The groundwater table was encountered in the borings at a depth of about 3.5 feet below the ground surface during the exploration, corresponding to an elevation of about 0 to 1 feet. Groundwater and free water will be tidally influenced at the site. Fluctuation in the groundwater levels may also occur due to variations in precipitation, runoff, construction activity, and other local factors.

## Subsurface Evaluation

We have evaluated the project information, site and subsurface conditions described in the previous sections with regard to design and construction of the proposed replacement culvert. We anticipate the base of the new box culvert will be located near the interface of the Stratum 1 fill and Stratum 2 sands based on the results of the test borings. While these materials are far from ideal, we expect they can be capable of providing satisfactory support of a similar culvert structure with the aid of a granular bedding layer and geotextile. Debris and other unsuitable materials encountered during excavation will require removal and replacement with additional bedding or select material.

The Stratum 3 and Stratum 5 clays are normally to lightly overconsolidated based on the laboratory consolidation test and index property testing. Estimated subsurface stress and undrained strength profiles of the clays are shown in Figure 5.

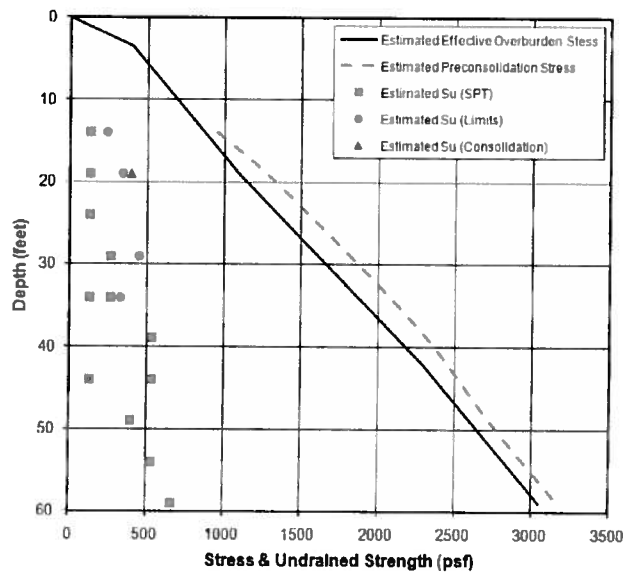



**Figure 5.** *Estimated Subsurface Stress & Undrained Strength Profiles*

A like kind replacement structure would be expected to result in minimal net stress increase on the subsurface soils. Preliminary total settlement estimates indicate that tolerable post-construction settlements are likely if the net stress increase associated with the new construction is on the order of 100 to 200 psf. Estimated settlements for various increases in net stress are shown in Figure 6. Total primary consolidation of the Strata 3 and 5 clays will likely take several years to decades to complete.

Construction means and methods will potentially impact the subgrade conditions and required bedding necessary to adequately support the culvert. The required bedding thickness will be based in part on the dewatering efforts used. It is recommended that construction of the culvert be completed in the dry with dewatering maintained below the subgrade elevation so that the

foundation soils can be verified. A cofferdam will be necessary to dewater the site. Hydraulic analyses should be performed to determine whether maintenance of stream flow is required during construction.

# Recommendations

The following recommendations are provided based on subsurface data obtained from the site, our engineering analysis of the subsurface conditions encountered, and the project information furnished to us.

## *Culvert Support*

- Approved Stratum 1 fill material and the Stratum 2 sands are estimated to be satisfactory for supporting the new culvert with the aid of a crushed stone bedding layer. The recommended base bid thickness of the bedding layer is 12 inches. The actual thickness can be adjusted for the subgrade conditions and dewatering effort. The bedding material should consist of VDOT #57 gradation crushed stone.

- A geotextile fabric should be placed on the subgrade soils below the bedding layer to provide separation. The recommended geotextile is a nonwoven needle punched fabric having a minimum grab tensile strength on the order of 140 pounds.

- Subgrade conditions encountered during excavation should be observed by a qualified field inspector to assess their composition and suitability. The contract should include base bid unit prices or other contingency budget for removing and disposing additional quantities of unsuitable soil and buried debris. Additional excavation should be backfilled using select material or additional bedding material.

- If the soil conditions encountered are different from those described in this report, the design geotechnical engineer should be contacted.

- Preliminary total (primary consolidation) settlement estimates for various net stress increases are shown in Figure 6.

- To provide lateral anchorage and to minimize the potential for undermining beneath the structure, a turndown concrete cutoff wall or other anti-seepage device should be used at both the inlet and outlet ends of the culvert.

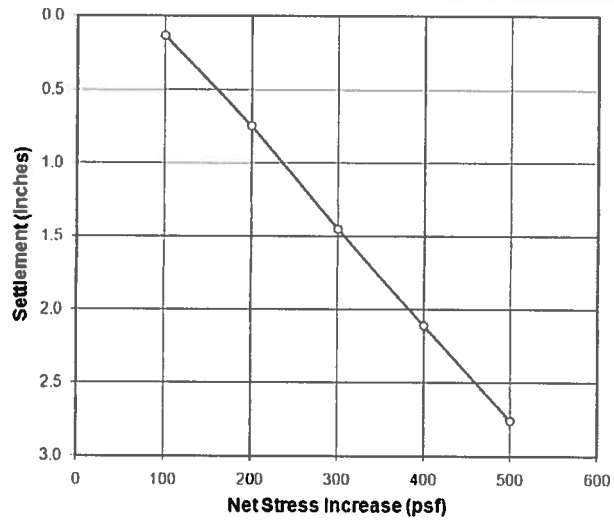



**Figure 6.** *Estimated Total Settlements vs. Net Stress Increase*

- If the ends of the new culvert will be susceptible to scour, the end areas should be protected using riprap over geotextile fabric in accordance with VDOT and Virginia Stormwater Management standards.

## *Estimated Soil Parameters*

- Subsurface conditions encountered in the borings indicate the following in-situ soil parameters in the upper 35 feet.

| Approx. Elevation (feet) | Moist Unit Weight, $\gamma_m$ (pcf) | Buoyant Unit Weight, $\gamma'$ (pcf) | Angle of Internal Friction, $\phi$ (deg.) | Undrained Cohesion, $c_u$ (psf) |
|---|---|---|---|---|
| +4 to -5 | 118 | 58 | 28 | 0 |
| -5 to -8 | 112 | 56 | 30 | 0 |
| -8 to -15 | 98 | 45 | 0 | 250 |
| -15 to -31 | 100 | 45 | 0 | 450 |

- Active pressures are generated when sufficient wall movement occurs away from lateral earth pressure. Typical minimum movement required for active pressures are 0.002H and 0.015H for cohesionless and cohesive soils, respectively, where H is the height of the wall. Passive pressures occur when external loads force the wall into the soil. Typical movements for passive pressures are 0.01H for sands and 0.03H for clays. Classic equations for Rankine active and passive coefficients and pressures with horizontal backfill are:

- Active Coefficient, $K_a = \tan^2(45 - \phi/2)$
- *Active Pressure, $p_a = K_a\gamma h - 2c(K_a)^{1/2}$
- Passive Coefficient, $K_p = \tan^2(45 + \phi/2)$
- *Passive Pressure, $p_p = K_p\gamma h + 2c(K_p)^{1/2}$

- Where below grade walls are restrained at the top such that the minimum active condition deflections do not occur, walls should be designed for at-rest pressures. The effective, drained at-rest earth pressure, $p_o$ and coefficient, $K_o$ may be determined as:

  - $K_o = 1\text{-}\sin(\phi)$ for cohesionless soils
  - $K_o = 0.6$ for soft to firm clay
  - $K_o = 1$ for peat
  - *At-rest pressure, $p_o = K_o\gamma h$

  **Note that these equations may be inappropriate for sloped backfill and design of excavation bracing systems.*

## Excavation and Dewatering

- Construction difficulties associated with excavation and groundwater control should be anticipated since the culvert base is below the water level. Dewatering using pumping from sump pits inside a sheet pile cofferdam will likely be most effective for this project.

- Excavation is anticipated to require temporary sheeting and shoring brace the sides of the excavation and prevent subsidence of the existing roadway. Excavations should be made in accordance with current OSHA rules and regulations for Type C soil conditions.

- Soils within excavations below the groundwater will be susceptible to a quick condition or heave during construction. Sheeting should be installed sufficiently deep enough below the dewatering level to maintain base stability.

- Excavation bracing systems should be designed by the contractor's registered professional engineer.

## Fill and Backfill

- Representative samples of proposed materials should be collected before filling operations begin and tested to determine the maximum dry density, optimum moisture content, natural moisture content, CBR, gradation and plasticity. These tests are needed for quality control during construction and to determine if the fill material is acceptable.

- All soil backfill used within the right-of-way should consist of non plastic select material conforming to VDOT Type I or III. Soils should be free of debris and deleterious materials.

- Based on the boring and laboratory data, the Stratum 2 sands and some of the Stratum 1 fill soils which are kept free of clay, organics and debris are expected to be satisfactory for reuse as select backfill material. Excavated materials will likely require drying prior to reuse.

- Bedding material and backfill used in excavations below the water level should consist of VDOT gradation #57 crushed quarry stone. The aggregate should be tamped into place using construction equipment or hand tampers after it is brought up above the dewatering level. Subsequently the aggregate can serve as a stable base for placement and compaction of the remaining backfill soil.

- Fill and backfill soils should be constructed by spreading acceptable soil in thin, even layers not exceeding 6 inches in loose thickness for hand operated equipment. Each layer of soil should be compacted to achieve a dry density of at least 95 percent of the laboratory maximum dry density as determined by VTM-1.

- The moisture content of fill soils should be maintained within ±3 percentage points of the optimum moisture content determined from the laboratory Proctor density test.

- The following properties may be assumed for select fill material when placed and compacted properly:

| | |
|---|---|
| Internal Friction Angle, $\phi$ (deg.) | 30 |
| Soil-Concrete Coefficient of Friction (tan $\delta$) | 0.35 |
| Cohesion / Adhesion, $c_a$ (psf) | 0 |
| Moist Unit Weight, $\gamma$ (pcf) | 120 |
| Active Pressure Coefficient, Ka | 0.33 |
| At-Rest Pressure Coefficient, Ko | 0.50 |
| Passive Pressure Coefficient, Kp | 3.00 |

- Material used within the top 12 inches of pavements should have a minimum soaked laboratory CBR value of 15 by AASHTO T193.

- Constructed fill should be adequately protected from weather, construction traffic and properly maintained throughout construction. Excavations to receive backfill should not be left open for extended periods.

- Fill should not be placed on wet or frozen ground. Fill which becomes softened from excess moisture should be aerated and recompacted to acceptable levels, or removed and replaced with new compacted fill.
- Field density and moisture content tests should be conducted on each soil fill and aggregate base layer by a qualified testing laboratory.

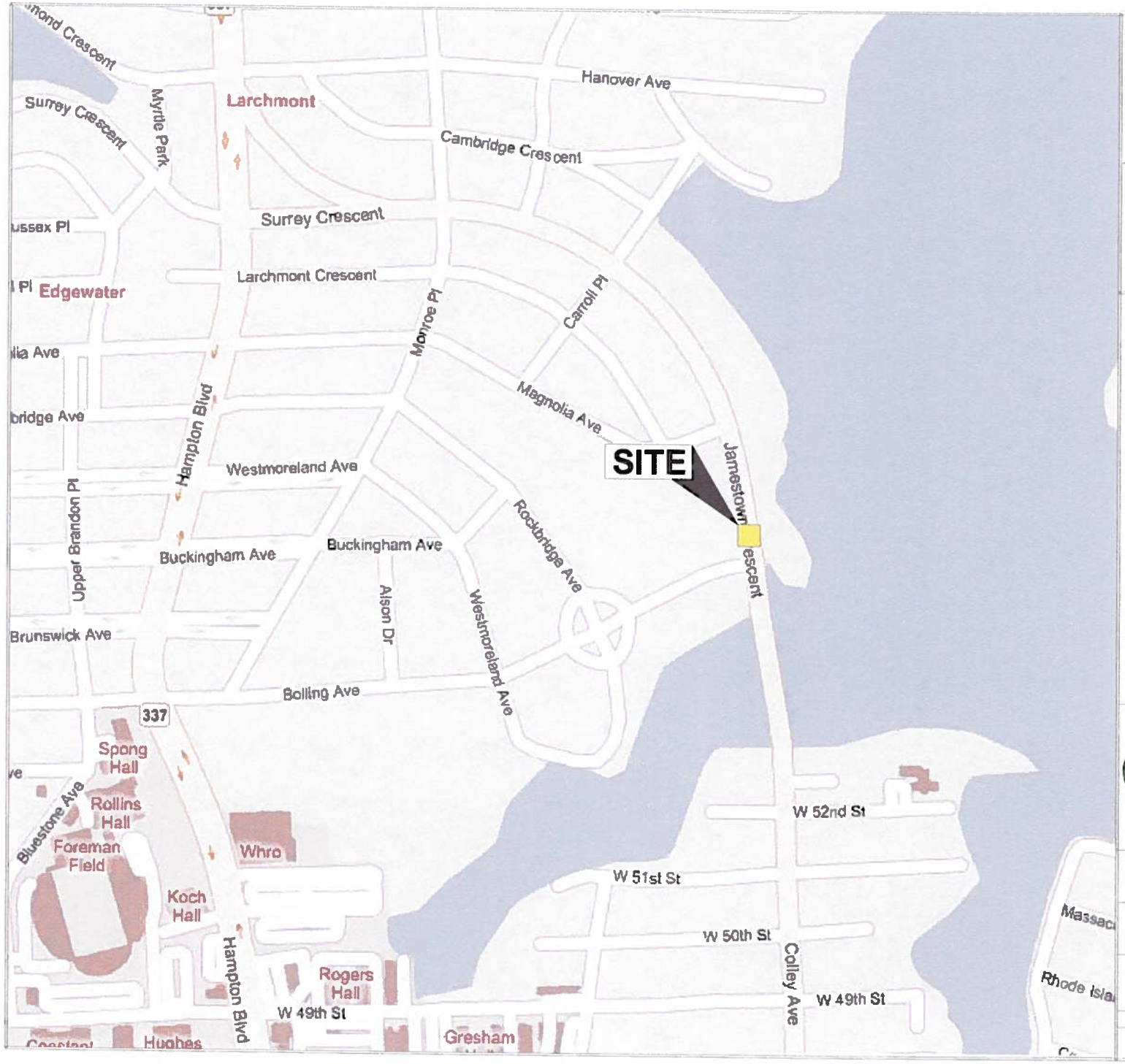
# Limitations

The analyses and recommendations provided are based in part on project information provided to us. They only apply to the specific project and sites discussed in this report. If the project information section in this report contains incorrect information or if additional information is available, you should convey the correct or additional information to us and retain us to review our recommendations.

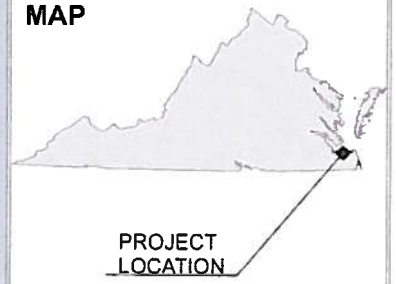
Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between borings will be different from those at specific boring locations and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Unanticipated conditions should be reported to the design team along with timely recommendations to solve the problems encountered.

# APPENDIX A

DRAWINGS




## VICINITY MAP




**SOURCE:**
**Bing Maps**
**2009**

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Virginia Beach, VA 23452

## SITE LOCATION PLAN

Jamestown Crescent
Culvert Replacement
Norfolk, VA

| PROJECT NUMBER | DRAWING NUMBER |
|---|---|
| 110-5377 | 1 |

Approximate Soil Test Boring Location

NOTES:
The boring locations shown were not surveyed and may be several feet from the locations indicated. Boring locations shall be considered approximate.

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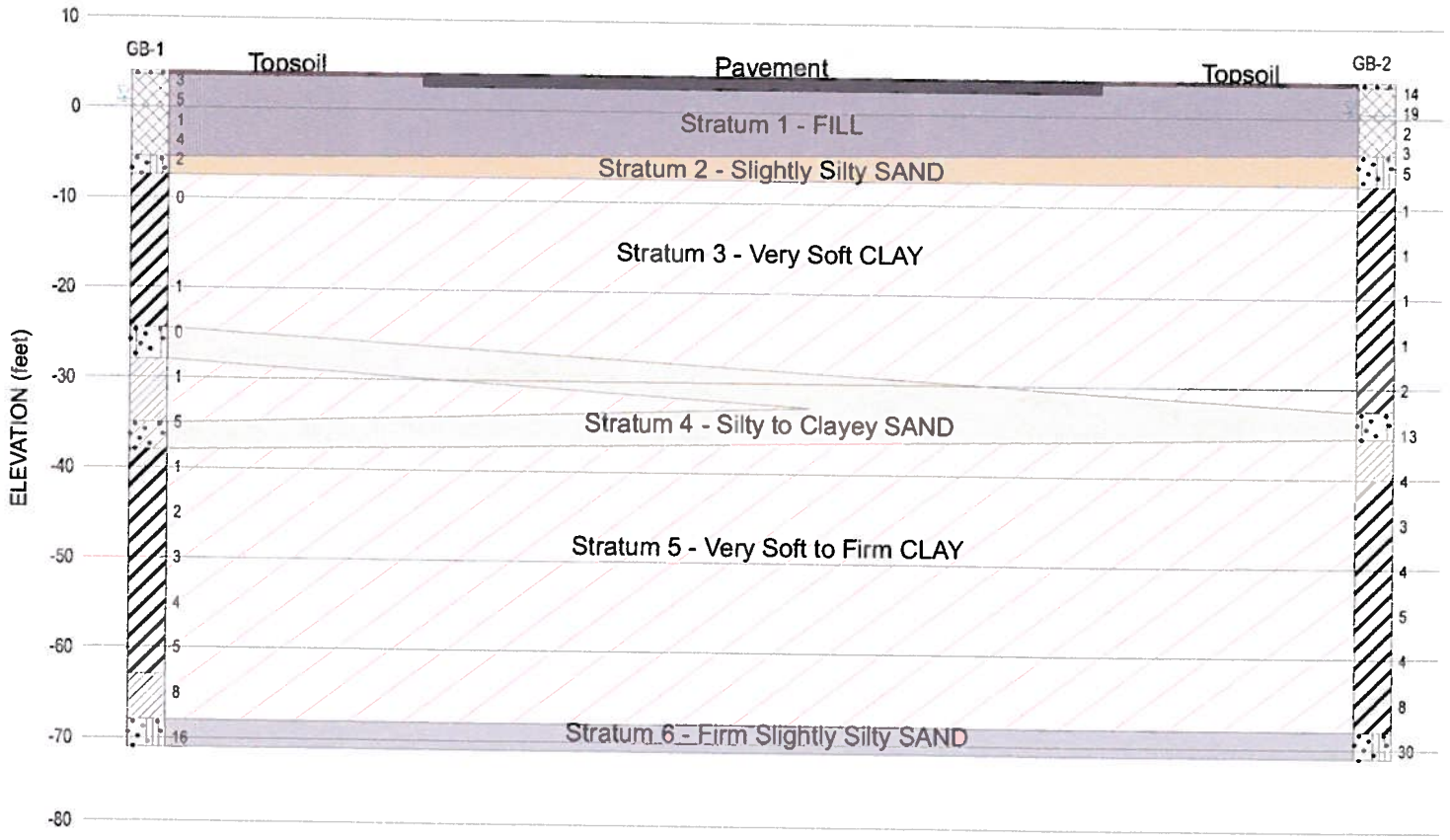
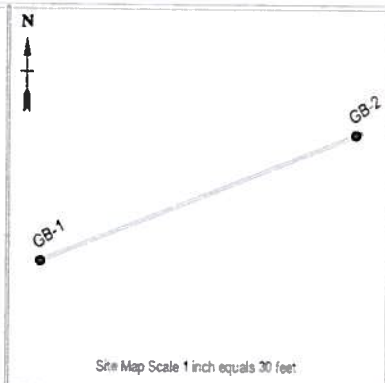
**BORING LOCATION PLAN**

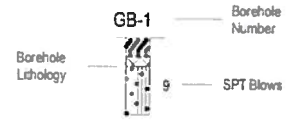
Jamestown Crescent
Culvert Replacement
Norfolk, VA

| PROJECT NUMBER | DRAWING NUMBER |
|---|---|
| 110-5377 | 2 |




## Explanation




Water Level Reading at time of drilling.

Water Level Reading after drilling.

### Lithology Graphics

- Topsoil
- SM, Silty Sand
- Fill
- CL, Low Plasticity Clay
- Slightly silty, poorly graded sand
- SC, Clayey Sand
- CH, High Plasticity Clay

NOTES:
The subsurface conditions presented are based on the data collected at specific boring locations only. Actual subsurface conditions will likely vary from those indicated.

Elevations and strata depths shall be considered approximate.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# SUBSURFACE PROFILE

Jamestown Crescent
Culvert Replacement
Norfolk, VA

| PROJECT NUMBER | DRAWING NUMBER |
|---|---|
| 110-5319 | 3 |

# APPENDIX B

FIELD TEST DATA

# TEST BORING RECORDS

The enclosed test boring records represent our interpretation of the subsurface conditions encountered at the specific boring locations at the time explorations were made based on visual examination of the field samples obtained and selected laboratory classification testing if performed. The lines designating the interface between various strata on the boring records represent the approximate interface location. In addition, the transition between strata may be more gradual than indicated. Water levels shown represent the conditions only at the time of the field exploration. It is possible that soil and groundwater conditions between the individual boring locations will be different from those indicated. Boring surface and strata elevations, if shown, shall be considered approximate and are referenced to project datum shown on the plans or described in the geotechnical report unless noted otherwise.

# BORING LOG LEGEND

## KEY TO DRILLING SYMBOLS

| | | | | | |
|---|---|---|---|---|---|
| | Split Spoon Sample (ASTM D 1586) | | Water Table at Time of Drilling | H.S.A. | Hollow Stem Auger Drilling |
| | Undisturbed Sample (ASTM D 1587) | | Water Table after 24 hrs. | M.R. | Mud Rotary Wash Drilling |
| | Rock Coring (ASTM D 2113) | | Boring Cave In | PP | Pocket Penetrometer (tsf) |
| | | | Loss of Drilling Fluid | REC | Core Recovery (%) |
| | | | Auger Refusal | RQD | Rock Quality Designator (%) |
| | Roller Cone Advanced | | Roller Cone Refusal | SCR | Solid Core Recovery (%) |
| | Seepage into Borehole | | Approximate Strata Change Depth Different Soil Types | | Approximate Strata Change Depth Similar Soil Types |

## CORRELATION OF RELATIVE DENSITY AND CONSISTENCY WITH STANDARD PENETRATION TEST RESISTANCE (ASTM D 1586)[§]

**SPT RESISTANCE (N) IN BLOWS PER FOOT**

| SPT N | RELATIVE DENSITY[†] SAND & GRAVEL | SPT N | CONSISTENCY[†] SILT & CLAY |
|---|---|---|---|
| 0 - 4 | Very Loose | 0 - 2 | Very Soft |
| 5 - 10 | Loose | 3 - 4 | Soft |
| 11 - 30 | Firm | 5 - 8 | Firm |
| 31 - 50 | Dense | 9 - 15 | Stiff |
| 51 + | Very Dense | 16 - 30 | Very Stiff |
| | | 31 - 50 | Hard |
| | | 51 + | Very Hard |

## ROCK QUALITY[‡]

FRACTURES, JOINT SPACING AND BEDDING

| RQD (%) | DIAGNOSTIC DESCRIPTION | ROCK PARAMETER FIELD/LAB RATIO | SPACING | JOINTS | BEDDING |
|---|---|---|---|---|---|
| 0 - 25 | Very Poor | 0.15 | Less than 2" | Very Close | Very Thin |
| 25 - 50 | Poor | 0.20 | 2" to 1' | Close | Thin |
| 50 - 75 | Fair | 0.25 | 1' to 3' | Moderately Close | Medium |
| 75 - 90 | Good | 0.30 to 0.70 | 3' to 10' | Wide | Thick |
| 90 - 100 | Excellent | 0.70 to 1.00 | More than 10' | Very Wide | Very Thick |

### HARDNESS

Very Hard - Breaking specimens requires several hard hammer blows

Hard - Hard hammer blow required to detach specimens

Moderately Hard - Light hammer blow required to detach specimens

Medium - May be scratched 1/16" deep by a knife or nail, breaks into several pieces by light hammer blow

Soft - Can be gouged readily by knife or nail, corners and edges broken by finger pressure

Very Soft - May be carved with a knife and readily broken by finger pressure

### WEATHERING

Fresh - Fresh rock, bright crystals, no staining

Slight - Minimum stainaing and discoloration, open joints contain clay

Moderate - Significant portions of rock shows staining and discoloration, strong rock fragments

Severe - All rock shows staining, rock fabric evident but reduced strength

Very Severe - All rock shows staining, rock mass effectively reduced to soil with strong rock fragments remaining

Complete - Rock reduced to soil with rock fabric not discernable

[§] *Resistance of a standard 2-inch O.D., 1.375-inch I.D. split spoon sampler driven by a 140 pound hammer free-falling 30 inches.*

[†] *after Terzaghi and Peck, 1968*

[‡] *after D. U. Deere, 1963, 1967*

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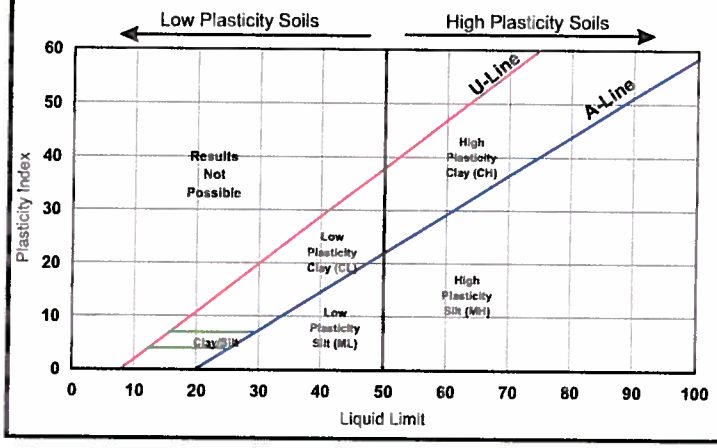
# SOIL CLASSIFICATION CHART (ASTM D 2487)

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS<br>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | CLEAN GRAVELS<br>(LITTLE OR NO FINES) | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| | SAND AND SANDY SOILS<br>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | CLEAN SANDS<br>(LITTLE OR NO FINES) | | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | | | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | | SANDS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS | LOW PLASTICITY LIQUID LIMIT LESS THAN 50 | | ML | INORGANIC SILTS, CLAYEY SILTS, SILT-VERY FINE SAND MIXTURES, ROCK FLOUR |
| | | | | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, SILTY, & LEAN CLAYS |
| | | | | OL | ORGANIC SILTS AND ORGANIC CLAYS OF LOW PLASTICITY |
| | | HIGH PLASTICITY LIQUID LIMIT GREATER THAN 50 | | MH | INORGANIC SILTS AND MICACEOUS, DIATOMACEOUS AND ELASTIC SILTY SOILS |
| | | | | CH | INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS |
| | | | | OH | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| OTHER SOILS | HIGHLY ORGANIC SOILS | | | PT | PEAT, HUMUS, MUCK, SWAMP SOILS WITH VERY HIGH ORGANIC CONTENTS |
| | UNCONTROLLED FILLS | | | | DISTURBED SOILS WITH POSSIBLE DEBRIS AND RUBBLE, OLD CONSTRUCTION WASTES, NON-ENGINEERED BACKFILLS |
| | DECOMPOSED OR PARTIALLY WEATHERED ROCK | | | | TRANSITIONAL MATERIAL BETWEEN SOIL AND ROCK WHICH MAY RETAIN THE RELICT STRUCTURE OF THE PARENT ROCK |

**Atterberg Limits**




PARTICLE SIZE IDENTIFICATION

| | | |
|---|---|---|
| BOULDERS: | | Greater than 300 mm (12 in.) |
| COBBLES: | | 75 mm to 300 mm (3 - 12 in.) |
| GRAVEL: | Coarse - | 19.0 mm to 75 mm (0.75 - 3 in.) |
| | Fine - | 4.75 mm to 19.0 mm (#4 - 0.75 in.) |
| SANDS: | Coarse - | 2.00 mm to 4.75 mm |
| | Medium - | 0.425 mm to 2.00 mm |
| | Fine - | 0.075 mm to 0.425 mm |
| SILTS & CLAYS: | | Less than 0.075 mm |

PLASTICITY INDEX (PI) & SHRINK-SWELL POTENTIAL

| | |
|---|---|
| 0 - 4 | None |
| 4 - 15 | Slight or Low |
| 15 - 30 | Medium to High |
| 31+ | High to Very High |

ADDITIONAL RELATIVE DESCRIPTIVE VALUES

| | |
|---|---|
| Trace < 10% | Some < 35% but > 20% |
| Little < 20% but > 10% | And > 35% |

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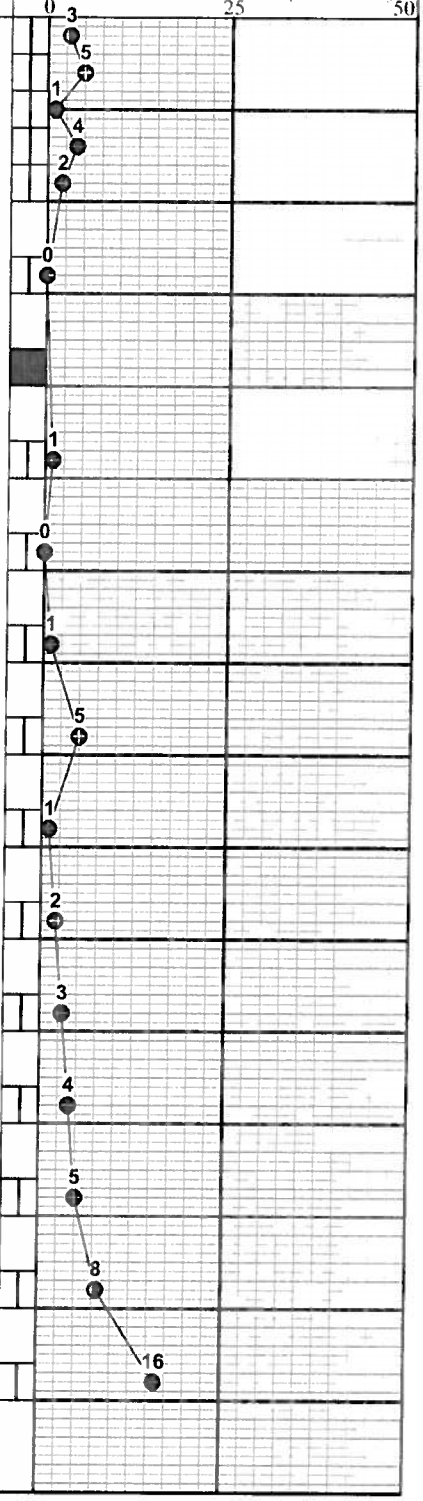
# TEST BORING RECORD

| | | |
|---|---|---|
| **GeoEnvironmental Resources, Inc.** Environmental, Groundwater, Hazardous Materials, Geotechnical & Industrial Engineering Consultants | | Boring #: **GB-1** (Page 1 of 1) |
| Project: **Jamestown Crescent Culvert Replacement** | GER Project Number: **110-5377** | Date Drilled: **3/26/2010** |
| Location: **Norfolk, Virginia** | Driller: **Fishburne** | Drill Method: **4" Mud Rotary** |
| Depth (ft.): **75.0** / Elevation (ft.): **4.0** | Client: **Moffatt & Nichol** | Hammer Type: **Automatic** |

| Elevation ft | Elevation m | Depth ft | Depth m | Lithology | Material Description | Ground Water | Comments |
|---|---|---|---|---|---|---|---|
| | | | | | 4 inches topsoil | | |
| | | | | | **FILL** sampled as clayey sand, dark brown to tan, fine to medium, trace gravel and crushed stone | ▽ | |
| | | | | | **FILL** sampled as clayey silty sand, dark gray and brown, fine to medium, trace shells and brick | | |
| | | | | | **Slightly Silty SAND (SP-SM)** Very loose, gray, fine to medium, trace clay and shell fragments | | |
| | | | | | **Silty, High Plasticity CLAY (CH)** Very soft, dark gray, trace sand, shell fragments and organics | | |
| | | | | | **Silty SAND (SM)** Very loose, gray, fine, trace clay | | |
| | | | | | **Silty, Low Plasticity CLAY (CL)** Very soft, gray, trace sand | | |
| | | | | | **Clayey SAND (SC)** Loose, gray, fine | | |
| | | | | | **Silty, High Plasticity CLAY (CH)** Very soft to firm, gray, trace sand and shell fragments | | |
| | | | | | **Silty, Low Plasticity CLAY (CL)** Firm, dark gray, with thin lenses of sand | | |
| | | | | | **Slightly Silty SAND (SP-SM)** Firm, dark gray, fine to medium, trace clay | | |
| | | | | | Boring terminated at 75 feet. | | |

SPT — Uncorrected Penetration Resistance (blows/foot)



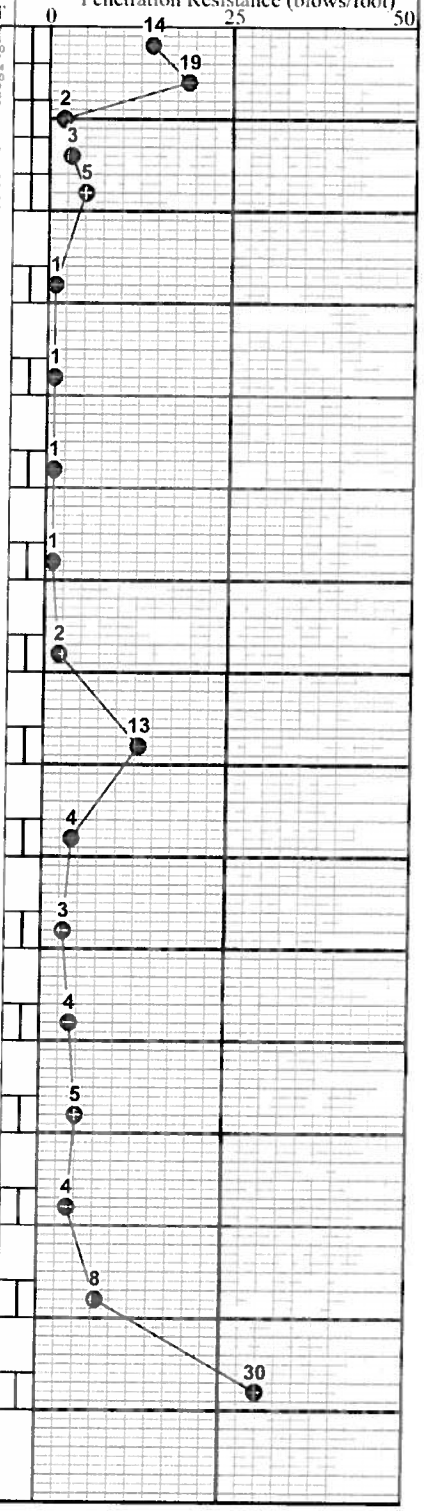

TEST BORING RECORD WITH HAMMER INFO 5377.GPJ GEOENVIRONMENTAL RESOURCES.GDT 4/21/10

# TEST BORING RECORD

| | | |
|---|---|---|
| **GeoEnvironmental Resources, Inc.** Environmental, Groundwater, Hazardous Materials, Geotechnical & Industrial Engineering Consultants | | Boring #: **GB-2** (Page 1 of 1) |
| Project: **Jamestown Crescent Culvert Replacement** | GER Project Number: **110-5377** | Date Drilled: **3/26/2010** |
| Location: **Norfolk, Virginia** | Driller: **Fishburne** | Drill Method: **3" Mud Rotary** |
| Depth (ft.): **75.0** / Elevation (ft.): **4.0** | Client: **Moffatt & Nichol** | Hammer Type: **Automatic** |

| Elevation ft | Elevation m | Depth ft | Depth m | Lithology | Material Description | Ground Water | Comments |
|---|---|---|---|---|---|---|---|
| | | | | | 6 inches topsoil | | |
| | | | | | **FILL** sampled as clayey sand, brown and black, trace to some clay, brick and crushed stone | ▽ | |
| | | | | | **FILL** sampled as silty sand, dark brown and black, trace wood, slag, clay lenses and organics | | |
| | | | | | **Slightly Silty SAND (SP-SM)** Loose, gray, fine to medium | | |
| | | | | | **Silty, High Plasticity CLAY (CH)** Very soft, dark gray to gray, trace sand, organics and shell fragments | | |
| | | | | | **Silty SAND (SM)** Firm, brownish-gray, fine, trace clay | | |
| | | | | | **Silty, Low Plasticity CLAY (CL)** Soft, mottled gray with brown | | |
| | | | | | **Silty, High Plasticity CLAY (CH)** Soft to firm, bluish-gray to gray, trace sand and shell fragments | | |
| | | | | | **Slightly Silty SAND (SP-SM)** Firm, gray, fine to medium | | |
| | | | | | Boring terminated at 75 feet. | | |

SPT — Uncorrected Penetration Resistance (blows/foot)




TEST BORING RECORD WITH HAMMER INFO 5377.GPJ GEOENVIRONMENTAL RESOURCES GDT 4/21/10

# APPENDIX C

LABORATORY TEST DATA

# LABORATORY TESTING

The enclosed laboratory results represent the subsurface soil properties encountered at the specific boring locations based on the laboratory testing performed. It is possible that soil properties and conditions between the individual boring locations and depths will be different from those indicated.

# LABORATORY TEST RESULTS SUMMARY

**Project:** Jamestown Crescent Culvert Replacement
Norfolk, VA

**Number:** 110-5377

**Date:** 04/16/10

| SAMPLE NUMBER | DEPTH (FEET) | SAMPLE TYPE | CLASS. | MOISTURE CONTENT (%) | % FINES | LL | PL | PI | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|
| GB-1 | 5 | SS | SC | 19.4 | 28.1 | - | - | - | SIEVE |
| GB-1 | 9 | SS | SM | 20.6 | 17.3 | - | - | - | SIEVE |
| GB-1 | 19 | UD | CH | 71.3 | - | 82 | 32 | 50 | CONSOLIDATION |
| GB-1 | 34 | SS | CL | 33.2 | - | 35 | 18 | 17 | - |
| GB-2 | 7 | SS | SM | 22.3 | 18.4 | - | - | - | SIEVE |
| GB-2 | 14 | SS | CH | 55.3 | - | 68 | 26 | 42 | - |
| GB-2 | 29 | SS | CH | 60.9 | - | 71 | 27 | 44 | - |

Tests performed in accordance with applicable ASTM Standards.

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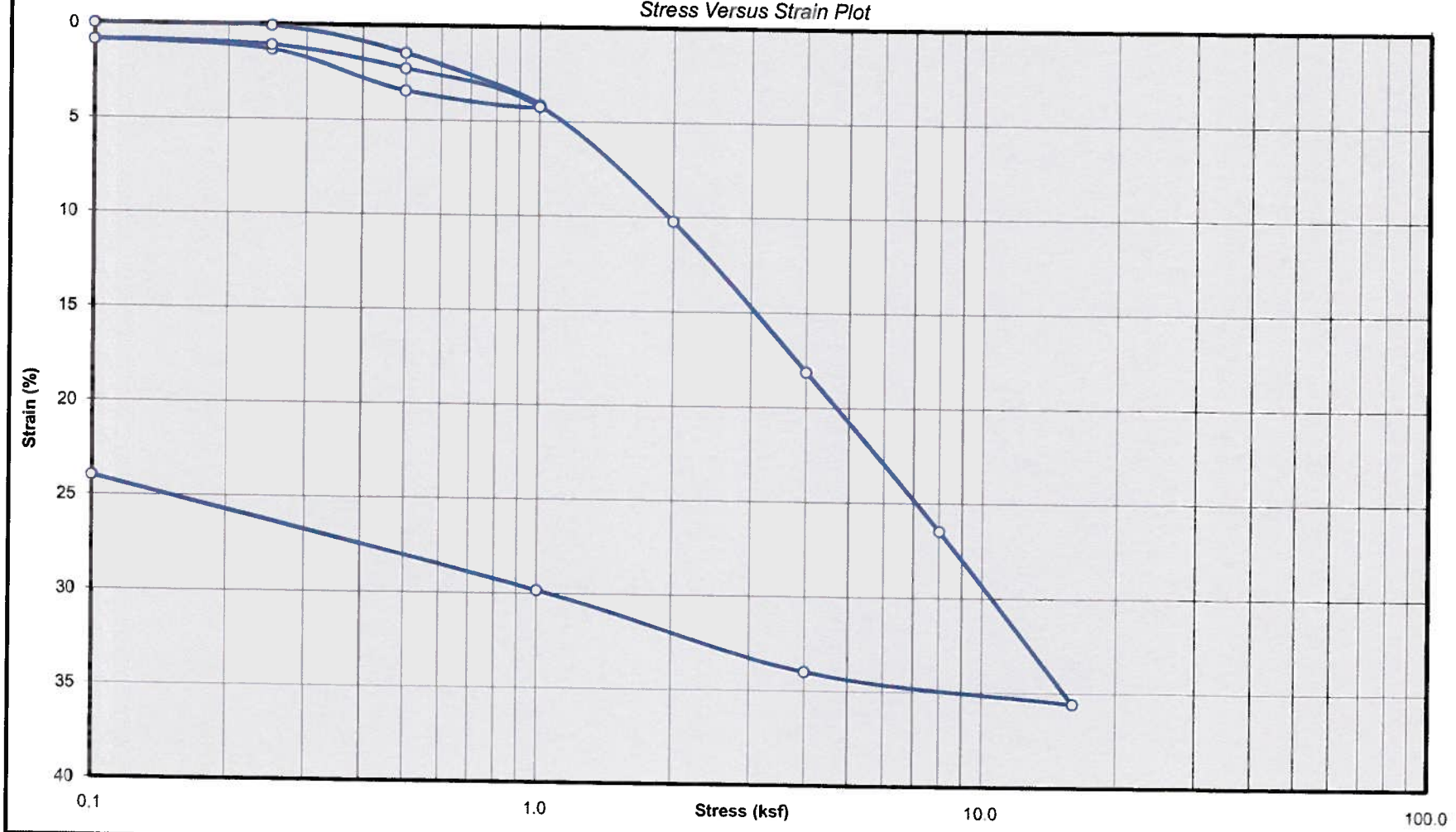
## One Dimensional Consolidation Test

*Stress Versus Strain Plot*




| | | | | | |
|---|---|---|---|---|---|
| Compression Index, Cc: | 0.875 | Estimated Preconsolidation Pressure, P'c (ksf): | 1.30 | Ao: | 0.84 |
| Swelling Index, Cs: | 0.138 | Estimated Effective Overburden Pressure, P'o (ksf): | 1.15 | Estimated OCR: | 1.1 |
| Recompression Index, Cr: | 0.097 | Estimated Undrained Strength at Su/P = 0 3 (ksf): | 0.39 | | |
| Initial Wet Unit Weight (pcf) = | 97.5 | Project: | Jamestown Crescent Culvert Replacement | | |
| Initial Dry Unit Weight (pcf) = | 56.9 | Project #: | 110-5377 | | |
| Initial Water Content (%) = | 71.3 | Location: | Norfolk, VA | | |
| Initial Saturation (%) = | 99.3 | Client: | Moffatt & Nichol | | |
| Specific Gravity = | 2.64 | Sample Classification: | CLAY (CH), Dark Gray, w/Silt, Tr Organics | | |
| Initial Void Ratio = | 1.90 | Boring: | GB-1 | | |
| Liquid Limit = | 82 | Sample Depth: | 19 feet | | |
| Plastic Limit = | 32 | Report Date: | 4/19/2010 | | |

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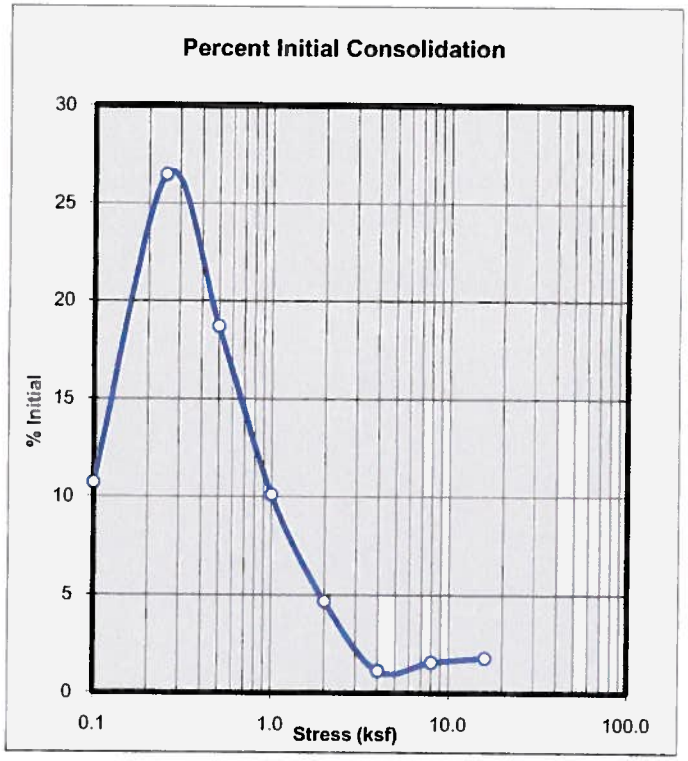


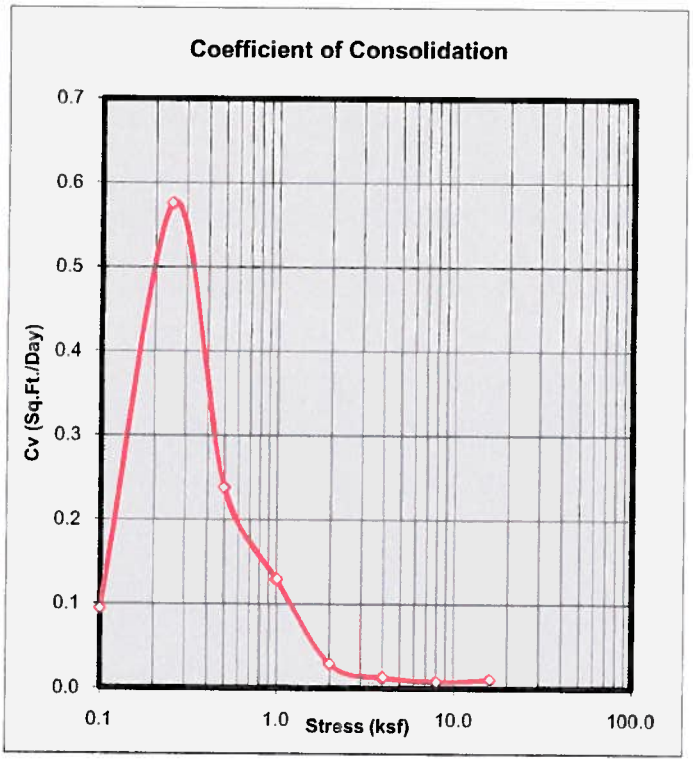


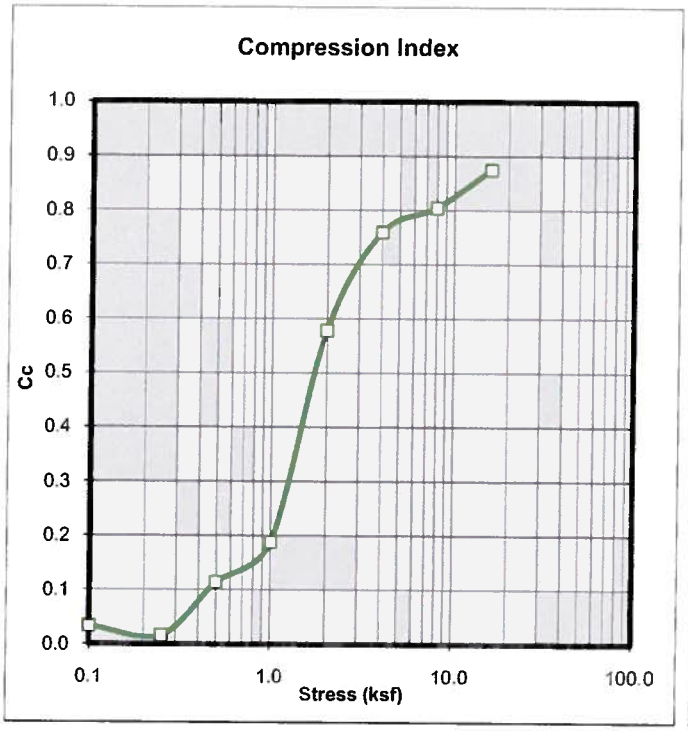


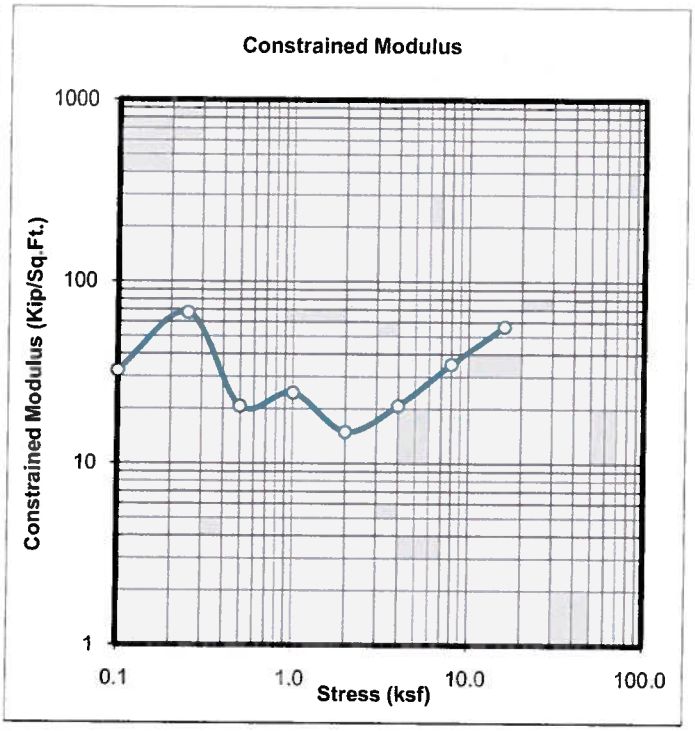


| | |
|---|---|
| Initial Wet Unit Weight (pcf) = | **97.5** |
| Initial Dry Unit Weight (pcf) = | **56.9** |
| Initial Water Content (%) = | **71.3** |
| Initial Saturation (%) = | **99.3** |
| Specific Gravity = | **2.64** |
| Initial Void Ratio = | **1.90** |
| Liquid Limit = | **82** |
| Plastic Limit = | **32** |

| | |
|---|---|
| Project: | **Jamestown Crescent Culvert Replacement** |
| Project #: | **110-5377** |
| Location: | **Norfolk, VA** |
| Client: | **Moffatt & Nichol** |
| Boring: | **GB-1** |
| Sample Depth: | **19 feet** |
| Report Date: | **4/19/2010** |

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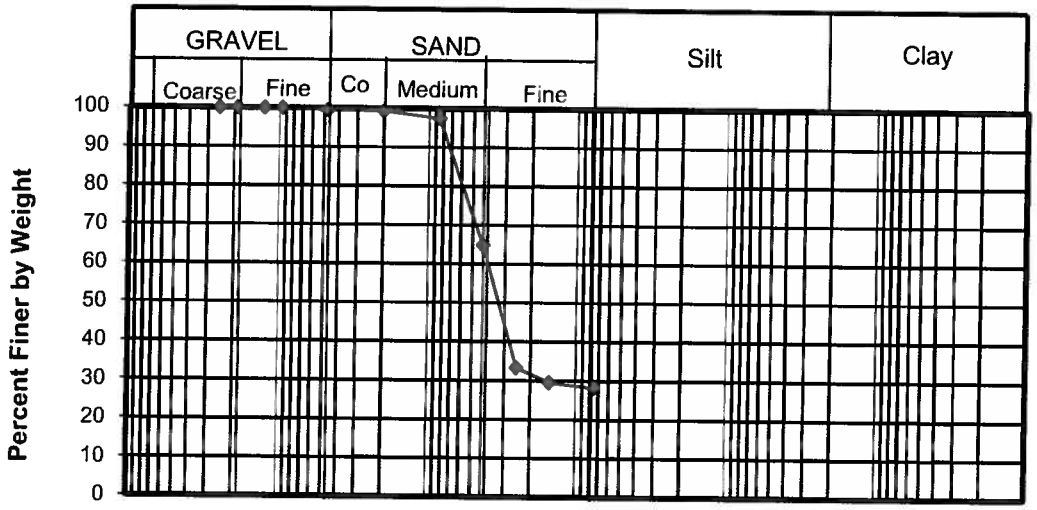
## SIEVE ANALYSIS

Project Name: **Jamestown Crescent Culvert Replacement**
GER Project Number: **110-5377**
Number: 4839-110
Sample Number: GB-1
Sample Depth: 5 feet
Sample Description: Clayey SAND (SC), Gray, Fine to Medium, Some Silt, Trace Fine Gravel
Test Method: ASTM D 422

### Sieve Analysis Data

| SIEVE NO. | PERCENT PASSING |
|---|---|
| 1 Inch | 100.0 |
| 3/4 Inch | 100.0 |
| 1/2 Inch | 100.0 |
| 3/8 Inch | 100.0 |
| 4 | 99.5 |
| 10 | 99.3 |
| 20 | 97.4 |
| 40 | 64.8 |
| 60 | 33.3 |
| 100 | 29.6 |
| 200 | 28.1 |



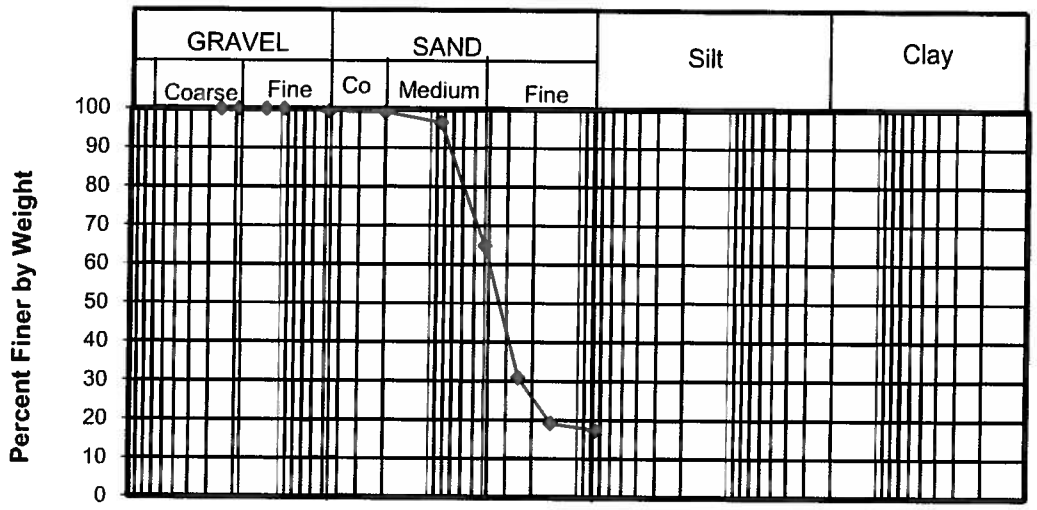
# Engineering and Testing Consultants, Inc.

## SIEVE ANALYSIS

Project Name: **Jamestown Crescent Culvert Replacement**
GER Project Number: **110-5377**
Number: 4839-110
Sample Number: GB-1
Sample Depth: 9 feet
Sample Description: Silty SAND (SM), Gray, Fine to Medium, Trace Clay, Trace Fine Gravel
Test Method: ASTM D 422

### Sieve Analysis Data

| SIEVE NO. | PERCENT PASSING |
|---|---|
| 1 Inch | 100.0 |
| 3/4 Inch | 100.0 |
| 1/2 Inch | 100.0 |
| 3/8 Inch | 100.0 |
| 4 | 99.5 |
| 10 | 99.3 |
| 20 | 96.6 |
| 40 | 64.8 |
| 60 | 30.9 |
| 100 | 19.1 |
| 200 | 17.3 |



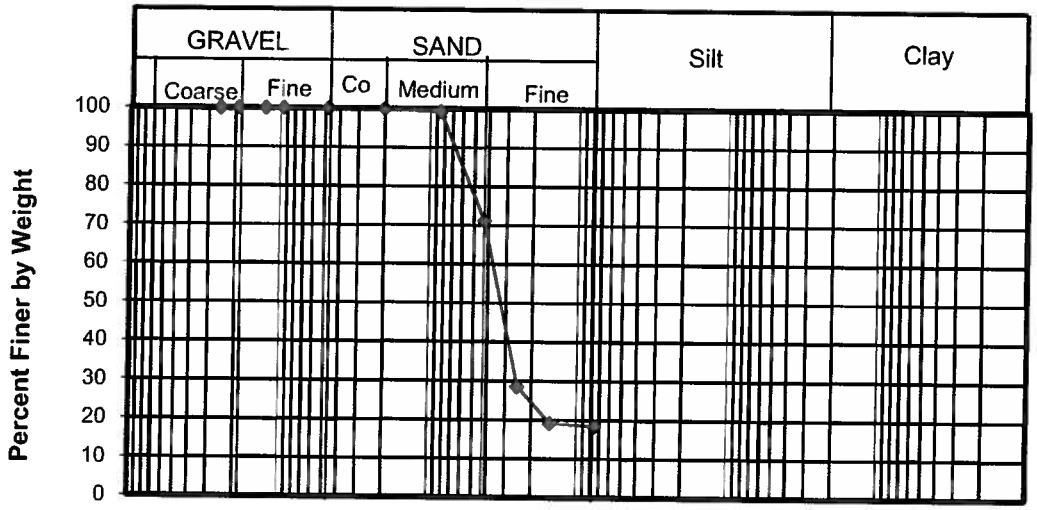
# Engineering and Testing Consultants, Inc.

## SIEVE ANALYSIS

Project Name: **Jamestown Crescent Culvert Replacement**
GER Project Number: **110-5377**
Number: 4839-110
Sample Number: GB-2
Sample Depth: 7 feet
Sample Description: Silty SAND (SM), Dark Gray, Fine to Medium, Trace Clay, Trace Organics
Test Method: ASTM D 422

### Sieve Analysis Data

| SIEVE NO. | PERCENT PASSING |
|---|---|
| 1 Inch | 100.0 |
| 3/4 Inch | 100.0 |
| 1/2 Inch | 100.0 |
| 3/8 Inch | 100.0 |
| 4 | 100.0 |
| 10 | 99.9 |
| 20 | 99.3 |
| 40 | 71.2 |
| 60 | 28.6 |
| 100 | 19.1 |
| 200 | 18.4 |



# APPENDIX D

PROCEDURES

# GEOTECHNICAL EXPLORATION PROCEDURES

***Boring, Sampling & Standard Penetration Testing***

Standard penetration testing and split barrel sampling are conducted at regular intervals in a borehole in accordance with ASTM D 1586. Standard practice on most **GER** projects is to perform this testing and sampling continuously within the upper 10 feet of the subsurface, and then at maximum 5-foot center-to-center intervals thereafter. At the desired test depth, the drilling tools are removed and a split barrel sampler is connected to the drilling rods and lowered back into the borehole. The sampler is first seated six inches into the bottom of the hole to penetrate any loose cuttings from the drilling operations. It is then driven an additional 12 inches by the impact of a 140 pound hammer free-falling 30 inches. The number of hammer blows required to drive the sampler for each 6-inch interval is recorded. The combined number of blows required to drive the sampler the final 12 inches is designated *standard penetration resistance* or *N-value*. Representative portions of soil from each split barrel sample are placed in air tight glass jars or plastic bags and transported to a laboratory.

***Undisturbed Sampling***

Split barrel samples are used for visual examination and simple laboratory classification tests; however, they are disturbed and not sufficiently intact for quantitative laboratory testing such as strength or consolidation. When such laboratory testing is desired, relatively undisturbed samples are obtained by slowly pushing a 3-inch diameter, thin-walled (16 gauge) galvanized steel tube into the soil at desired sampling depths. This is followed by carefully removing the soil-filled tube from the borehole and sealing the ends to prevent moisture loss. The procedure is described in ASTM D 1587. Undisturbed tube samples are most frequently used for sampling cohesive soils (clay and silt), but may be used to sample fine grained cohesionless soils with the aid of a piston sampling head.

***Excavation***

When explorations do not require machine-drilled borings, excavations, test pits, hand auger borings and other means described in ASTM D 4700 may be used to observe shallow subsurface conditions and to collect soil samples. The maximum depth of these methods is generally limited by the depth of groundwater. These methods are useful in obtaining bulk samples for laboratory classification, compaction and other remolded tests.

***Rock Coring***

Core drilling methods described in ASTM D 2113 are used to advance boreholes into rock or extremely dense soils which are not penetrable by conventional boring methods and typically exhibit more than 100 blows per foot by ASTM D 1586. Core drilling methods employed by **GER** use double tube swivel-type designed equipment with a drilling fluid, in which an outer tube rotates and performs the cutting while the inner tube remains stationary and collects a continuous sample of rock.

***In-Situ Methods***

In-situ tests are sometimes used on projects to obtain additional subsurface data. These methods provide direct and empirical measurement of various soil properties without collection of actual samples. Because samples are not collected, it is not common practice in the U. S. to

utilize in-situ tests alone to accomplish geotechnical investigations. On projects where in-situ testing is used, it is customary to perform them in conjunction with borings.

***Soil Classification***

Soil classification tests provide a general guide to the engineering properties of various soil types. Samples obtained during drilling operations are examined and visually classified by an engineer or geologist according to consistency, color and texture. These classification descriptions are included on the boring records. The classification system is primarily qualitative and for detailed soil classification, two laboratory tests are necessary; grain size tests and plasticity tests. Using these test results, the soil can be classified according to the AASHTO or Unified Classification System (ASTM D 2487). Each of these classification systems and the in-place physical soil properties provides an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented on the following sheets.

***Grain Size Tests***

Grain size tests are performed to determine the soil classification and the grain size distribution. The soil samples are prepared for testing according to ASTM D 421 (dry preparation) or ASTM D 2217 (wet preparation). The grain size distribution of soils coarser than the #200 U.S. Standard Sieve (0.074 mm opening) is determined by passing the samples through a standard set of nested sieves. Materials passing the No. 200 sieve are suspended in water and the grain size distribution calculated from the measured settlement rate. These tests are conducted in accordance with ASTM D 422.

***Plasticity Tests***

Plasticity tests are performed to determine the soil classification and plasticity characteristics. The soil plasticity characteristics are defined by the Plastic Index (PI) and the Liquid Limit (LL). The PI is related to the volume changes which occur in confined soils beneath foundations. The PI and LL are determined in accordance with ASTM D 4318.

***Physical Properties***

The in-place physical properties are described by the specific gravity, wet unit weight, moisture content, dry unit weight, void ratio and percent saturation of the soil. The specific gravity and moisture content are determined by ASTM D 854 and D 2216, respectively. The wet unit weight is found by obtaining a known volume of soil and dividing the wet sample weight by the known volume. The dry unit weight, void ratio and percent saturation are calculated values.

***California Bearing Ratio***

The California Bearing Ratio (CBR) test is a comparative measure of the shearing resistance of a soil. It is used with empirical curves to design asphalt pavement structures. The test is performed in accordance with ASTM D 1883 or Virginia Test Method Designation VTM-8. A representative bulk sample is compacted in a six-inch diameter CBR mold in five (5) equal layers, using 45 evenly spaced blows per layer with a 5.5 lb. hammer falling 12 inches. CBR tests may be run on the compacted samples in either soaked or unsoaked conditions, with samples penetrated at the rate of .05 inches per minute to a depth of 0.5 inches. The CBR value is the percentage of the load it takes to penetrate the soil to a specified depth compared to the load it takes to penetrate a standard crushed stone to the same depth.

***Consolidation Tests***

Consolidation tests determine the change in height of a soil sample with increasing load. The results of these tests are used to estimate the settlement and time rate of settlement of structures constructed on similar soils. The test is run in accordance with ASTM D 2435 on a single element of an extruded undisturbed sample. The test sample is trimmed into a disk approximately 2½ inches in diameter and one inch thick. The disk is confined in a stainless steel ring and sandwiched between porous plates and subjected to incrementally increasing vertical loads, with the resulting deformations measured with micrometer dial gauges. Void ratios and percent strain deformation are then calculated from these readings. The test results are presented in the form of a stress-strain or vertical pressure versus void ratio curve.

***Triaxial Shear Tests***

Triaxial shear tests are used to determine the strength characteristics and elastic properties of a soil sample. Triaxial shear tests are conducted either on relatively undisturbed samples of virgin material or on remolded-compacted samples of representative site materials. The samples are then trimmed into cylinders and encased in rubber membranes. Each is then placed into a compression chamber and confined by hydrostatic cell pressure. An axial load is applied until the sample fails in shear. Test results are presented in the form of stress-strain curves and stress paths to failure.

Various types of triaxial tests may be performed. The most suitable type of triaxial test is determined by the loading conditions imposed on the soil in the field and by drainage characteristics of the site. Types of triaxial tests normally performed include:

- Consolidated-Isotropic-Undrained (CIU test)
- Consolidated-Anisotropic-Undrained ($CK_oU$ test)
- Consolidated-Isotropic-Drained (CID test)
- Consolidated-Anisotropic-Drained ($CK_oD$ test)
- Unconsolidated-Undrained (UU test)

GeoEnvironmental Resources, Inc.

# APPENDIX B

Permit # 11-0586

# Commonwealth of Virginia
# Marine Resources Commission
# Authorization

A Permit has been issued to:

**City of Norfolk**
**City Hall 7th Floor**
**810 Union Street**
**Norfolk, Virginia 23510**

The Permittee is hereby authorized to:

**Replace a failing box culvert, dredge 176 cubic yards of state-owned, subaqueous bottom, and place 1,595 square feet of riprap upon state owned subaqueous bottom of Bolling Creek, a tributary of the Lafayette River, near Jamestown Crescent in the City of Norfolk.**

Issuance Date: **July 1, 2011**

Expiration Date: **July 31, 2014**

Tony Watt

Commissioner or Designee

*This Notice Must Be Conspicuously Displayed At Site Of Work*

# APPENDIX C

# STORM WATER POLLUTION PREVENTION PLAN
(Pursuant to Virginia Regulation 4 VAC 50-60-10 et seq.)

For

# Jamestown Crescent Culvert Replacement
# 6207-20

Department of Public Works
Norfolk, Virginia

Prepared by:

**Moffatt & Nichol**
**800 World Trade Center**
**Norfolk, VA 23510**
**(757) 628-8222**

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## I. POLICY AND GENERAL PROCEDURES

It is the policy of the City of Norfolk (hereinafter referred to as the Owner) to secure authority to discharge storm water from land disturbing activates of one acre or greater (or 2,500 square feet or greater in Chesapeake Bay Preservation Act (CBPA) Areas) in full conformance with the storm water regulations of the Virginia Department of Conservation and Recreation (VDCR) as contained in 4 VAC 50-60-10 et seq. The Owner will secure appropriate coverage pursuant to these regulations.

The Contractor, and all subcontractors involved with grading, drainage, utilities or any other activity that disturbs site soil of one acre or greater (or 2,500 square feet or greater in Chesapeake Bay Preservation Act Areas) or who implement a pollutant control measure identified in the Storm Water Pollution Prevention Plan (SWPPP), must comply with the requirements of the Virginia Storm Water Management Program (VSMP) as contained in the VDCR VSMP storm water general permit and implementing regulations (4 VAC 50-60-10 et. seq.) and the erosion and sediment control requirements of the VDCR as published in the Virginia Erosion and Sediment Control Handbook (current edition). These requirements are as follows:

**Note to Engineer:** The Engineer will complete a VDCR Registration Statement form with information provided by the Owner and provide the completed form to the Owner with a copy of this completed SWPPP document.

A. The Owner will file a complete Registration Statement for coverage under a VSMP general permit for storm water discharges from construction activities with the Virginia Department of Conservation and Recreation and verification of coverage received from the Department of Conservation and Recreation ***prior to*** the commencement of land disturbing activities exceeding the thresholds noted above. The appropriate filing fee (as outlined below) in check form made out to "Treasurer of Virginia," must be submitted to the Department of Conservation and Recreation, Division of Finance, Accounts Payable before the general permit will be issued. The fees, payable by the Owner, are as follows:

- Greater than 2,500 ft, but less than one acre: $200
- Between one and five acres: $300
- Five acres or greater: $500

Remit the General Permit Fee Form with a copy of the Registration Statement to:

Department of Conservation and Recreation
Division of Finance, Accounts Payable
ATTN: Storm Water Permits
203 Governor Street
Richmond, Virginia 23219

Send the General Permit Registration Statement with
a copy of the Fee Form and fee check to:

Department of Conservation and Recreation
Storm Water Permitting
203 Governor Street, Suite 206

Richmond, VA 23219

B. A copy of the Registration Statement for coverage under the general permit for storm water discharges from construction activities as well as the actual general permit when issued by the VDCR shall be maintained by the Contractor for inspection at the construction site. Land disturbing activities cannot commence until verification of coverage is received by the Contractor from VDCR.

C. A complete copy of the SWPPP, including copies of all inspection reports, plan revisions, etc., must be retained by the Contractor at the project site at all times during working hours and kept in the Owner's permanent project records for at least three years following submission of the Notice of Termination (NOT).

D. The Contractor must provide names and addresses of all subcontractors working on this project who will be involved with all construction activities that disturb site soil. This information must be kept with this SWPPP.

E. The Contractor and all subcontractors involved with land disturbing for this project must sign a copy of the appropriate certification statement included in Appendix B which will be incorporated into the construction contract.

F. As described below, the Contractor shall conduct regular inspections to determine effectiveness of the SWPPP. The SWPPP shall be modified by the Contractor as needed to prevent pollutants from discharging from the site. The Contractor's inspector must meet the definition of "Qualified Personnel" as contained in the Virginia Stormwater Management Program regulations:

- A Virginia licensed professional engineer; or,
- Virginia certified Responsible Land Disturber; or,
- Other person who holds a certificate of competency from the Virginia Soil and Water Conservation Board in the area as an erosion and sediment control inspector or erosion and sediment control combined administrator.

Additionally, the Contractor's inspector must either be someone empowered to implement modifications to this SWPPP and the pollutant control devices, if needed, in order to increase effectiveness to an acceptable level, or someone with the authority to cause such things to happen.

This SWPPP shall be updated each time there are modifications to the pollutant prevention system or a change of Contractors working on the project that disturbs site soil. The Contractor shall notify the Owner before these modifications are implemented, unless immediate Contractor action is necessary to prevent unauthorized discharges. If immediate Contractor action is needed, then the Contractor shall notify the Owner of the action as soon as practicable.

G. This SWPPP, including site maps, must be amended as necessary during the course of

construction in order to keep them current with the pollutant control measures utilized at the site. Amending the SWPPP does not mean that it has to be reprinted. It is acceptable to add addenda, sketches, new sections, and/or revised drawings. Site maps may be marked up by hand reflecting changes in site conditions and location of storm water pollution prevention measures that have been added, removed or relocated and a date of each change.

H. Discharge of petroleum, oil, lubricants or other hazardous substances with storm water is subject to reporting and cleanup requirements. In general, all petroleum, oil, lubricants or other hazardous substances spilled on site must be cleaned up and disposed of in accordance with state and federal regulations. Spills of solid materials (powders, mixes, granules) shall be cleaned up, placed in a sealed container and disposed of in accordance with state and federal regulations. All costs associated with the cleanup and disposal of solid materials to soil shall be borne by the contractor.

For liquid spills to soil of less than 25 gallons, the Contractor shall notify the Owner immediately, shall clean up the spilled material completely and then fill out and retain a spill report form found in Appendix H. The Contractor shall be responsible for all costs associated with required clean-up activities including disposal costs.

For liquid spills of 25 gallons or more of petroleum, oil, lubricants or other hazardous substances to soil, the Contractor shall notify the Owner immediately, shall clean up the spilled material completely and then fill out and retain a spill report form found in Appendix H. The Owner shall notify the DCR and DEQ in accordance with Part III.G of the VSMP General Permit. The Contractor shall be responsible for all costs associated with required clean-up activities including disposal costs. The Owner shall notify the DCR and DEQ within 24 hours discovery of the spill in accordance with Part III.G of the VSMP General Permit. The Contractor shall supply the Owner with any information requested regarding the spill event and shall cooperate fully with any site inspections by the Owner or other regulatory agencies.

For spills of any amount of petroleum, oil, lubricants or other hazardous substances to the storm sewer system or to state waters or wetlands, the Contractor shall notify the Owner immediately and take such measures as necessary to immediately stop the discharge of the material to the storm sewer system, state waters or wetlands. The Owner shall then notify DCR and DEQ immediately upon discovery of the spill in accordance with Part III.G of the VSMP General Permit. The Contractor shall furnish all equipment and manpower requested by the Owner or regulatory agencies to clean up the spilled material and shall supply the Owner with any information requested regarding the spill event and shall cooperate fully with the Owner or other regulatory agencies during and after the cleanup activities. The Contractor shall then fill out and retain a spill report form found in Appendix H.

Refer to Part III.G of the VSMP General Permit for additional information on spilled materials. Copies of the VSMP General Permit and the Registration Statement forms are available on the Department of Conservation and Recreation web site (www.dcr.virginia.gov/sw/vsmp.htm).

I. Once the site reaches final stabilization, the Contractor shall complete and submit two copies of the NOT form for activities on site. This form is included as Appendix D. If a

section or phase of the project reaches final stabilization prior to the entire project reaching final stabilization, then that section may be clearly marked on the site plans and the date of final stabilization recorded in the SWPPP. Areas so marked are no longer required to be inspected as a part of permit compliance.

J. This SWPPP is intended to control water-borne and liquid pollutant discharges by some combination of interception, filtration, and containment. The Contractor and all subcontractors implementing this SWPPP shall remain alert to the need to periodically refine and update the SWPPP in order to accomplish the intended goals.

K. This SWPPP shall be amended as necessary during the course of construction in order to keep it current with the pollutant control measures utilized at the site. Amending the SWPPP does not mean that it has to be reprinted. It is acceptable to handwrite revisions, add addenda, sketches, new sections, and/or revised drawings.

L. A record of the dates when land disturbing activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained by the Contractor until the NOT is filed. A log for keeping such records is included in the Appendices. A different form for the log may be substituted if it is found to be more useful; such replacement forms must be approved in writing by the Owner prior to its use.

## II. INTRODUCTION

This SWPPP has been prepared for land disturbing activities associated with the replacement of an existing culvert located along Jamestown Crescent in Norfolk VA. This SWPPP includes the elements necessary to comply with the Storm Water General Permit issued by the VDCR under the VSMP and all local governing agency requirements. This SWPPP shall be implemented at the start of construction.

Construction phase pollutant sources anticipated at the site are: **(mark all appropriate activities)**

☒ Disturbed (bare) soil

☒ Vehicle fuels and lubricants

☐ Chemicals associated with building construction, and building materials

☒ Asphalt and asphalt pavement waste; chlorine for water line flushing

☐ Other pollutants (specify)

Without adequate control there is the potential for each type of pollutant to be transported by storm water.

The project will consist of the following basic activities: **(mark all appropriate activities)**

☒ Site grading

☒ Paving work

☒ Installation of storm water management and drainage systems

☒ Installation of utilities

☒ Other activities (shoreline revetment)

Specifically, the work associated with this permit is the replacement of a deteriorating culvert located at the intersection of Jamestown Crescent and Bolling Ave. There will be no increase in drainage area or flow through the culvert. The existing culvert is deteriorating and its load rating has decreased significantly. The replacement culvert will be roughly the same size as the original and extends from Bolling Creek to the Lafayette River across Jamestown Crescent. Additionally, riprap and wing walls will be installed at the ends of the culvert as well as rerouting of an existing waterline and installation of a curb inlet.

Purpose

A major goal of pollution prevention efforts during project construction is to control soil and pollutants that originate on the site and prevent them from flowing to surface waters of the Commonwealth. The purpose of this SWPPP is to provide requirements for achieving that goal. A successful pollution prevention program also relies upon careful inspection and adjustments during the construction process in order to enhance its effectiveness.

Scope

This SWPPP must be implemented when land disturbing activities begin on the site. This SWPPP will be made available for public inspection upon request on the second and fourth Tuesday of the month in the Public Works Department, 7th floor, Norfolk City Hall during normal business hours for the term of the permit authorization for the site.

The SWPPP Construction Site Notice and copy of the permit coverage letter received from DCR must be posted conspicuously and readable from a public right-of-way at the job site. The Contractor is responsible for all costs associated with the posting and maintenance of the SWPPP Construction Site Notice and DCR coverage verification.

This SWPPP primarily addresses the impact of storm rainfall and runoff on areas of the ground surface disturbed during the construction process. In addition, there are recommendations for controlling other sources of pollution that could accompany the major construction activities. This SWPPP will terminate when disturbed areas are stabilized, construction activities covered herein have ceased, and a completed NOT is submitted to the VDCR. Termination becomes effective at midnight on the date the NOT is filed.

Forms required to implement the SWPPP are included in the Appendices to this document.

The VSMP General Permit for Storm Water Discharges from Construction Activities prohibits most non-storm water discharges during the construction phase. Allowable non-storm water discharges that may occur during construction on this project, which would therefore be covered by the General Permit, include:

1. Discharges from fire-fighting activities

2. Fire hydrant flushings

3. Water used to wash vehicles where detergents are not used

4. Water used to control dust

5. Potable water sources, including uncontaminated waterline flushings

6. Routine external building wash down which does not use detergents

7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used

8. Uncontaminated air conditioning or compressor condensate

9. Uncontaminated ground water or spring water

10. Foundation or footing drains where flows are not contaminated with process materials such as solvents

11. Uncontaminated excavation dewatering

12. Landscape irrigation

The techniques described in this SWPPP focus on providing control of pollutant discharges with practical approaches that utilize readily available expertise, materials, and equipment.

## III. PROJECT DESCRIPTION

Described below are the land disturbing construction activities that are the subject of this SWPPP. They are presented in the order (or sequence) they are expected to begin, but each activity will not necessarily be completed before the next begins. Also, these activities could occur in a different order if necessary to maintain adequate erosion and sedimentation control:

A. Project Description –The proposed project includes replacing the existing 12' x 5' box culvert with a like-kind replacement 12' x 6' single cell box culvert. The length of the culvert is approximately 75 ft. Cofferdams will be used on the upstream and downstream ends so the culvert may be constructed in the dry. The geotechnical investigation recommends the culvert be constructed in the dry to verify subsurface conditions and properly place granular material and geotextiles to support the culvert. No approaching or discharge channel dimensions will be altered during the culvert replacement. Additionally, a small retaining wall adjacent to the southeast headwall will be partially replaced within the City's right-of-way.

B. Suggested general sequence of construction is listed as follows:

1. Establish contractor laydown area and traffic control.

2. Install E&S measures and turbidity curtain.

3. Demolish pavement, curb sidewalk, curb inlet, 15” RCP, remove guardrail, drive temporary sheet piling, and excavate to limits of existing culvert.

4. Install gate valve and temporary service line, turn off water between new valve and Bolling Avenue.

5. Remove existing culvert, headwalls, wingwalls and waterline.

6. Install tight sheeting for culvert, headwalls, wingwalls and waterline.

7. Prepare subgrade and install 12’x6’ concrete single box culvert, headwalls, wingwalls, permanent sheet pile wall, cub inlet and 15” RCP. And penetrate existing 18” CPP through the southwest wingwall.

8. Install new water main to existing main and re-establish service.

9. Backfill culvert and complete remainder of site civil work associated with culvert replacement (grading, paving, sidewalk, guardrail, bike lane, ect.)

10. Restore site as shown.

C. Area of Land Disturbance - The area of land disturbance will be approximately 15,000 square feet.

D. Change in Runoff Coefficient - Not applicable. The runoff coefficient will not change due to the fact that any land disturbed due to replacement of culvert will be replaced in the same manner.

E. Site Vegetation – The project site extends across Jamestown Crescent from Bolling Creek to the Lafayette River. The road side area is predominantly vegetated in herbaceous species with the addition of occasional planted trees and shrubs. The creek and river banks are heavily vegetated predominately with shrubs and trees in addition to riprap.

F. Pollution Sources - Other potential sources of pollution include vehicle fueling.

G. Receiving Waterbody –Storm water from project side will run off into the Lafayette River.

H. Erosion Control Plan – The approved erosion and sediment control plans may be found in Appendix F.

It shall be the responsibility of the Contractor to denote on the SWPPP site maps the locations of any on-site vehicle fueling activities, equipment maintenance areas, concrete washout areas, mason’s work areas, portable toilets, dumpsters, chemical storage areas, and material stockpiles

to reflect current site conditions. As these areas are added, relocated or removed, the site maps shall be updated by the Contractor accordingly.

The actual schedule for implementing pollutant control measures will be determined by project construction progress. Down slope protective measures must always be in place before soil is disturbed.

## IV. SITE DESCRIPTION

Included as part of this SWPPP in Appendix F are selected project construction drawings. Please refer to them for detailed site information.

A. Site Location –The project site is located along Jamestown Crescent just north of Colley Ave Bridge. Bolling spans the west limits of construction for the culvert replacement. To the southeast of the culvert is a small creek within a City of Norfolk right-of-way easement that discharges into the Lafayette River. Several residential parcels are located east/northeast of the culvert; however, most construction activities under this contract will occur within the City of Norfolk right of way.

B. Site Topography and Coverage –The project site located on Jamestown Crescent. The site is relatively flat and has an elevation of approximately 4 ft. The banks of the Lafayette River and Bolling Creek are both slope protected with heavy vegetation and riprap.

C. Rainfall Information – The average annual rainfall for Norfolk, Virginia is 45.68 inches. The project is expected to start in June 2013 and end in September 2013. The average total precipitation during these 4 months amounts to 14.73 inches. (http://www.sercc.com/cgi-bin/sercc/cliMAIN.pl?va6139). A rain gauge shall be installed on site to determine if an inspection triggering rainfall event has occurred. An inspection "triggering rainfall event" is rainfall that equals or exceeds one half inch (0.5") in a 24-hour period at the construction site.

D. Site Soils – Based on a geotechnical report completed by geoenvirornmental resources in April 2010. Soils consist of uncontroled fill to a depth of about 8 to 9 feet and slightly silty sand to a depth of about 11 to 12 feet.

E. Total Area and Disturbed Area – The total area of the project amounts to .65 Acres and total disturbed area is 15,000 square feet.

F. Quality of Receiving Surface Waters and/or Wetlands – All storm water at the project site drains into the Elizabeth River. The Elizabeth River is listed as impaired on the Virginia Department of Environmental Quality 2010 305(b)/303(d) Water Quality Assesment Integrated Report. The waterway is listed as 5A meaning the Water Quality standard is not attained where TMDLs for a pollutant have been developed. A TMDL was established in 2010 for dioxin. In order to minimize the risk of polluting the water bodies downstream, E&S measures such as turbidity curtains and silt fences will be used to reduce the amount of suspended sediment.

G. Site Vegetation – The project site extends across Jamestown Crescent from Bolling Creek to the Lafayette River. The road side area is predominantly vegetated in herbaceous species with the addition of occasional planted trees and shrubs. The creek and river

banks are heavily vegetated predominately with shrubs and trees and riprap.

H. Threatened or Endangered Species or their Critical Habitat – There are no known populations of threatened or endangered species located on the project site or within a one to two mile radius.

I. Erosion Control Plan – The erosion and sediment control plans may be found in Appendix F

J. Permanent Storm Water Controls – Not applicable. No storm water management measures will be installed in this project.

## V. STORM WATER POLLUTION PREVENTION MEASURES AND CONTROLS

A variety of storm water pollutant controls (Best Management Practices) are recommended for this project. These controls are reflected in the Erosion and Sediment Control Plans enclosed herein as Appendix F. Some controls are intended to function temporarily and will be used as needed for pollutant control during the construction period. These include tree protection fence, silt fence, and gravel cub inlet sediment filter. For most disturbed areas, permanent stabilization will be accomplished by covering the soil with pavement, ruble retaining wall, vegetation, and/or other improvements.

A. Erosion and Sediment Controls

1. Short- and Long-Term Goals – All erosion and sediment control measures have been selected, designed and are to be installed in accordance with the Virginia Erosion and Sediment Control Law and Regulations. The short-term goal of construction phase stabilization is to minimize the loss of sediment to adjacent waters during construction. The long-term goal is to minimize the loss of sediment from the project once constructed by permanent soil stabilization. (add any project specific short- and long-term stabilization goals as appropriate.)

2. Soil Stabilization – The purpose of soil stabilization is to prevent soil from leaving the site. In the natural condition, soil is stabilized by existing vegetation. The primary technique to be used at this project for stabilizing site soil will be to provide a protective cover of turf grass.

(a) Temporary Seeding – Within seven (7) days after construction activity ceases on any particular area, all disturbed ground where there will not be construction for longer than thirty (30) days must be seeded with fast-germinating temporary seed suited for the particular climate/season and protected with mulch. Temporary seeding shall be in conformance with the project plans (refer to plan sheets providing instructions on temporary seeding.)

(b) Permanent Seeding or Sodding – All areas at final grade must be seeded or sodded within seven (7) days after completion of the land disturbance activity. Except for small level spots, seeded areas shall be protected

with mulch. Permanent seeding or Sodding shall be in conformance with the project plans. (refer to plan sheets providing instructions on permanent seeding or sodding.)

(c) Structural Controls – Storm water runoff is to be structurally controlled as depicted on Plan Sheets (identify major categories of structural controls and provide plan sheet numbers) of the plan set. (Such controls may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drainage, pipe slope drains, level spreaders, inlet protection, and outlet protection, soil retaining systems, gabions, temporary or permanent sediment basins and construction entrances.) Structural controls shall be keyed to land disturbing activities especially on sites with significant topography and shall be completely installed prior to commencement of such land disturbing activities.

(d) Final Stabilization – Final stabilization is not considered established until a ground cover is achieved that is uniform, mature enough to survive, and will inhibit erosion. The Contractor shall stabilize all exposed earth areas with permanent vegetation as described in the project plans (refer to appropriate project plan sheets.)

B. Storm Water Management Controls

1. The following storm water management controls have been utilized on this project (mark all appropriate activities and provide a brief explanation of each. Refer to project plans as appropriate):

☐ Dry ponds – brief explanation

☐ Storm water retention/detention structures – brief explanation

☐ Flow attenuation from swales and natural depressions – brief explanation

☐ Infiltration of site runoff – brief explanation

☐ Bio-retention systems – brief explanation

☐ Storm water wetlands – brief explanation

☐ Water quality structures – brief explanation

☒ Other measures (Specify) – Tree Protection Fence, Silt Fence, and Gravel Curb Sediment Filter, Filter Bag.

C. Construction Phase "Best Management Practices"

Control of sediments has been described previously. Other aspects of this SWPPP are listed below: (Cross check against E&S plan)

1. Solid Waste Disposal – No solid materials, including building materials, are allowed to be discharged from the site with storm water. All solid waste, including disposable materials incidental to the major construction activities, must be collected, removed from the site, and disposed of in a legal manner. The locations of solid waste collection containers must be shown on the SWPPP site maps.

2. Sanitary Facilities – All personnel involved with construction activities must comply with state and local sanitary or septic system regulations. Temporary sanitary facilities where provided at the site throughout the construction phase must be utilized by all construction personnel and shall be serviced by a commercial operator when provided. Their location must be shown on the SWPPP site maps if installed on site.

3. Water Source – Non-storm water components of site discharge must be clean water. Water used for construction which discharges from the site must originate from a public water supply or private well approved by the Virginia Department of Health. Water used for construction that does not originate from an approved public supply must not discharge from the site. It is to be retained in ponds until it infiltrates and/or evaporates.

D. Construction Phase "Best Management Practices"

During the construction phase, the Contractor shall implement the following measures where appropriate:

1. All soil stockpile areas shall be maintained sufficiently far from water bodies, wetlands, storm water inlets, and storm water conveyances to minimize sediment release to these features and shall be adequately protected from erosion in accordance with Virginia Erosion and Sediment Control Minimum Standard 2 to preclude migration of sediments into these features.

2. The Contractor shall designate areas for equipment cleaning, maintenance, and repair. The Contractor and subcontractor(s) shall utilize those areas. The areas shall be protected by a temporary perimeter berm or filter fabric.

3. Use of detergents for large scale washing is prohibited (e.g., vehicles, buildings, pavement surfaces, etc.)

4. Chemicals, paints, solvents, fertilizers, and other toxic material must be stored in waterproof containers. Except during application, the contents must be kept locked in trucks or within locked storage facilities. Runoff containing such material must be collected, removed from the site, treated, and disposed at an approved solid waste or chemical disposal facility.

5. All on-site fuel tanks shall have fill ports and hose nozzles secured by a lock provided and used by the Contractor at the end of each work day. Each fuel tank shall be of double walled construction or placed in a containment basin designed to hold 110% of the contents of the tank, or both and shall have spill cleanup materials accessible to personnel using filling the tank or dispensing product from the tank.

E. Spill Response Activities

Spills of petroleum, oil, lubricants or other hazardous substances with storm water are subject to documentation, reporting and cleanup requirements. All petroleum, oil, lubricants or other hazardous substances spilled on site must be cleaned up and disposed of in accordance with state and federal regulations. Spills of solid materials (powders, mixes, granules) shall be cleaned up, placed in a sealed container and disposed of in accordance with state and federal regulations. All costs associated with the cleanup and disposal of solid materials to soil shall be borne by the contractor.

For liquid spills to soil of less than 25 gallons, the Contractor shall notify the Owner immediately, shall clean up the spilled material completely and then fill out and retain a spill report form found in Appendix H. The Contractor shall be responsible for all costs associated with required clean-up activities including disposal costs.

For liquid spills of 25 gallons or more of petroleum, oil, lubricants or other hazardous substances to soil, the Contractor shall notify the Owner immediately, shall clean up the spilled material completely and then fill out and retain a spill report form found in Appendix H. The Owner shall notify the DCR and DEQ in accordance with Part III.G of the VSMP General Permit. The Contractor shall be responsible for all costs associated with required clean-up activities including disposal costs. The Owner shall notify the DCR and DEQ within 24 hours discovery of the spill in accordance with Part III.G of the VSMP General Permit. The Contractor shall supply the Owner with any information requested regarding the spill event and shall cooperate fully with any site inspections by the Owner or other regulatory agencies.

For spills of any amount of petroleum, oil, lubricants or other hazardous substances to the storm sewer system or to state waters or wetlands, the Contractor shall notify the Owner immediately and take such measures as necessary to immediately stop the discharge of the material to the storm sewer system, state waters or wetlands. The Owner shall then notify DCR and DEQ immediately upon discovery of the spill in accordance with Part III.G of the VSMP General Permit. The Contractor shall furnish all equipment and manpower requested by the Owner or regulatory agencies to clean up the spilled material and shall supply the Owner with any information requested regarding the spill event and shall cooperate fully with the Owner or other regulatory agencies during and after the cleanup activities. The Contractor shall then fill out and retain a spill report form found in Appendix H.

Refer to Part III.G of the VSMP General Permit for additional information on spilled materials. Copies of the VSMP General Permit and the Registration Statement forms are available on the Department of Conservation and Recreation web site (www.dcr.virginia.gov/sw/vsmp.htm). To notify DCR of a spill, call (757) 925-2392. To notify DEQ of a spill call the Pollution Reporting and Environmental Response (PREP) number (757) 518-2077.

## VI. LOCAL PLANS

In addition to this SWPPP, construction activities associated with this project must comply with all additional requirements set forth by the City of Norfolk.

## VII. INSPECTIONS AND SYSTEM MAINTENANCE

The purpose of site inspections is to assess performance of pollutant controls. The inspections shall be conducted by the Contractor's designated E&S inspector. The Contractor's inspector must meet the definition of "Qualified Personnel" as contained in the Virginia Stormwater Management Program regulations:

- A Virginia licensed professional engineer; or,
- Virginia certified Responsible Land Disturber; or,
- Other person who holds a certificate of competency from the Virginia Soil and Water Conservation Board in the area as an erosion and sediment control inspector or erosion and sediment control combined administrator.

Additionally, the Contractor's inspector must either be someone empowered to implement modifications to this SWPPP and the pollutant control devices, if needed, in order to increase effectiveness to an acceptable level, or someone with the authority to cause such things to happen.

<u>If deficiencies in the erosion and sediment control measures are determined, they shall be recorded on the inspection form by the Contractor and corrective action shall be initiated by the Contractor within the time frame specified below.</u>

Between the time this SWPPP is implemented and final site stabilization is achieved, all disturbed areas and pollutant controls <u>must</u> be inspected at the following intervals:

- <u>not less than once every fourteen (14) calendar days and</u>
- <u>within forty-eight (48) hours following an inspection triggering rainfall event. An inspection "triggering event" is rainfall equaling or exceeding one half inch (0.5") as measured by the on-site rain gauge within a 24-hour period )</u>. The Contractor shall install a rain gauge at the site to determine site specific rainfall conditions.

Based on these inspections, the Contractor shall decide whether it is necessary to modify this SWPPP, add or relocate sediment barriers, or institute other actions required in order to prevent pollutants from leaving the site via storm water runoff. The Contractor has the duty to repair, modify, maintain, or supplement pollutant control measures and take other actions necessary to achieve effective pollutant control.

Examples of particular items to be evaluated during site inspections are listed below. This list is not intended to be comprehensive. During each inspection, the Owner's and Contractor's inspectors must evaluate overall pollutant control system performance, as well as the effectiveness of system components. Additional factors should be considered as appropriate to the circumstances.

A. Locations where vehicles enter and exit the site must be inspected for evidence of off-site sediment tracking. A stabilized construction entrance will be constructed where vehicles enter and exit. This entrance will be maintained or supplemented as necessary to prevent

sediment from leaving the site on vehicles. Sediment tracked onto public roadways must be shoveled or swept from the roadway and re-deposited on site in a manner that minimizes its off-site release potential.

B. Sediment barriers must be inspected and, if necessary, they must be enlarged or cleaned in order to provide additional capacity. All material excavated from behind sediment barriers shall be stockpiled on the up slope side of the barrier. Additional sediment barriers must be constructed as needed. Sediment must be removed from sediment traps and sediment basins when the design capacity has been reduced by 50%.

C. Inspections will evaluate disturbed areas and areas used for storing materials that are exposed to rainfall for evidence of, or the potential for, pollutants entering the drainage system. If necessary, the materials must be covered or original covers must be repaired or supplemented. Also, protective berms must be constructed, if needed, in order to contain runoff from material storage areas.

D. Grassed areas will be inspected to confirm that a healthy stand of grass is maintained. The site has achieved final stabilization when turf grass cover provides permanent stabilization of the soil surface exclusive of areas that have been paved or covered by building(s). Permanent stabilization is not considered established until a ground cover is achieved that is uniform, mature enough to survive, and will inhibit erosion.

E. All discharge points must be inspected to determine whether erosion control measures are effective in preventing impacts to receiving waters.

Based on inspection results, any modification necessary to increase effectiveness of this SWPPP to an acceptable level shall be made by the Contractor within seven (7) calendar days of the inspection. All modifications to the SWPPP document and approved plan will be noted on the construction plans and communicated to the Owner's Inspector for the Owner's Inspector's written approval prior to implementation. The inspection reports must be completed entirely and additional remarks shall be included if needed to fully describe a situation. An important aspect of the inspection report is the description of additional measures that need to be taken to enhance plan effectiveness. The inspection report must identify whether the site was in compliance with the SWPPP at the time of inspection and specifically identify all incidents of non-compliance.

Inspection reports will be kept on file by the Owner as an integral part of this SWPPP for at least thirty-six (36) months following the month the Notice of Termination is filed with the VDCR.

It is the responsibility of the Contractor to ensure the adequacy of site storm water pollutant discharge controls. Physical site conditions, weather conditions, or Contractor practices may make it necessary to install more structural controls than are shown on the plans. (For example, localized concentrations of runoff could make it necessary to install additional sediment barriers.) Assessing the need for additional controls and implementing them or adjusting existing controls are key aspects of the effectiveness of this SWPPP until the site achieves final stabilization. The Owner shall be notified by the Contractor should a control fail, be bypassed, or otherwise be ineffective in maintaining sediments on-site and releasing sediment off-site. The Owner will provide notification to the VDCR and VDEQ in accordance with Part III. G. of the VSMP Storm Water General Permit, as necessary.

If it is determined by the Owner's Inspector that there has been an upset or bypass of the control measures resulting in a release of sediment to State waters, the Owner's Inspector shall report the bypass or upset to the Virginia Department of Conservation and Recreation, Suffolk Soil, and Water Conservation Office, via telephone at: 757-925-2392 or by fax at: 757-925-2388 and the Tidewater Regional Office of the Virginia Department of Environmental Quality (VDEQ) at: 757-518-2000 within 24 hours of discovery of the unanticipated bypass or upset.

Within five (5) days of making the verbal report to VDCR and VDEQ, a written report shall be submitted by the Owner containing:

- A description of the noncompliance and its cause
- The period of noncompliance, including exact dates and times
- If the noncompliance has not been corrected, the anticipated time it is expected to continue
- Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance

# APPENDICES

**APPENDIX A - VSMP REGISTRATION STATEMENT FOR COVERAGE UNDER STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES AND STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES (VAR10)**

**APPENDIX B - CONTRACTOR CERTIFICATION FORMS**

**APPENDIX C - INSPECTION REPORTS**

**APPENDIX D - NOTICE OF TERMINATION (NOT) FORM**

**APPENDIX E - RECORD OF STABILIZATION AND CONSTRUCTION ACTIVITY DATES**

**APPENDIX F - SWPPP CONSTRUCTION SITE NOTICE**

**APPENDIX G – BLANK SPILL REPORT FORM / SAMPLE COMPLETED SPILL REPORT FORM**

# APPENDIX A

## Registration Statement for Coverage under the VSMP General Permit for Storm Water Discharge from Construction Activities Filed with VDCR

## VSMP Permit Fee Form

## Storm Water General Permit for Construction Activities (VAR10)

Department of Conservation & Recreation
CONSERVING VIRGINIAS NATURAL & RECREATIONAL RESOURCES

# VSMP General Permit for Stormwater Discharges from Construction Activities (VAR10)

## Registration Statement

**(Please Type or Print All Information)**

1. **Construction Activity Operator** *(The permit will be issued to this operator, and the Certification in Item #13 must be signed by the appropriate person associated with this operator [see the instructions])*

   Name: Darrell Hill

   Mailing Address: 810 Union Street, 11th Floor

   City: Norfolk State: VA Zip: 23510 Phone: 757-664-4242

2. **(Must be included for renewals of coverage only) Existing Permit Coverage #:** _____

3. **Location of Construction Activity**

   Name: Jamestown Crescent Culvert Replacement

   Address: 820 Jamestown Crescent Ave (In Vicinity)

   Town, City, County: Norfolk State: VA Zip: 23508

   DMS to the nearest 15 seconds : Latitude DD 36 MM 53 SS 34 Longitude DD 76 MM 17 SS 45

   **Location of all Offsite Support Activities to be Covered Under the Permit**

   Name: _____

   Address: _____

   Town, City, or County: _____ State: _____ Zip: _____

   If street address unavailable: Latitude _____ Longitude _____

4. **Status of Activity:** Federal ☐ State ☐ Public ☒ Private ☐ (Check one only)

5. **The Nature of the Construction Activity** (e.g., commercial, industrial, residential, agricultural, oil and gas, etc.)**:**
   Culvert replacement

6. **Name of the Receiving Water(s):** Lafayette River

   **Hydrologic Unit Code (HUC):** _____

   (Receiving waters identified as impaired on the 2008 305(b)/303(d) Water Quality Assessment Integrated Report or for which a TMDL WLA has been established for stormwater discharges from a construction site shall be noted in an attached list.)

7. **If the discharge is through a Municipal Separate Storm Sewer System (MS4), the name of the municipal operator of the storm sewer:** Norfolk

8. **Estimated Project Start Date (mm/dd/yyyy):** 06/14/2013 **Estimated Project Completion Date (mm/dd/yyyy)**: 09/06/2013

9. **Total Land Area of Development** (to the nearest one-tenth acre)**:** _____

   **Estimated Area to be Disturbed** (to the nearest one-tenth acre)**:** 0.34

10. **Is the area to be disturbed by the construction activity part of a larger common plan of development or sale?** Yes☐ No☒

11. **Are nutrient offsets intended to be acquired for this activity?** Yes☐ No☒ Under consideration☐

12. **A stormwater pollution prevention plan (SWPPP) must be prepared in accordance with the requirements of the General VSMP Permit for Discharges of Stormwater from Construction Activities <u>prior to</u> submitting this Registration Statement. By signing this Registration Statement the operator is certifying that the SWPPP has been prepared.**

13. **Certification:** "I certify under penalty of law that I have read and understand this Registration Statement and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

    Print Name: _____ Title: _____

    Signature: _____ Date: _____

**(Please sign in INK. The person signing this form must be associated with the operator identified in Item #1 above.)**

Mail to: Department of Conservation and Recreation, Stormwater Permitting, 203 Governor Street, Suite 206 Richmond, VA 23219

# INSTRUCTIONS for FORM DCR 199-146

## VPDES General Permit Registration Statement - Construction Activity Stormwater Discharges

**General**

A Registration Statement must be submitted to the Department of Conservation and Recreation to register for coverage under the General VSMP Permit for Stormwater Discharges from Construction Activities.

**Section 1 Construction Activity Operator Information**

"Operator" means the owner or operator of any facility or activity subject to the VSMP permit regulation. In the context of stormwater associated with a large or small construction activity, operator means any person associated with a construction project that meets either of the following two criteria: (i) the person has direct operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) the person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other permit conditions (i.e., they are authorized to direct workers at a site to carry out activities required by the stormwater pollution prevention plan or comply with other permit conditions).

The entities who are considered operators will commonly consist of the owner or developer of a project (the party with control of project specifications) and the general contractor (the party with day to day operational control of the activities at the project site which are necessary to ensure compliance with the permit). Contractors and subcontractors who are under the general supervision of the general contractor are not considered operators and would not need to submit a registration statement. Give the legal name of the operator, do not use a colloquial name. Enter the complete address and phone number of the operator. **The permit will be issued to this operator.**

**Section 2 Existing Permit Coverage Number**

For reapplications only, indicate the existing permit coverage number for the project. This section does not need to be completed for initial applications for coverage for new projects.

**Section 3 Location of Construction Activity Information**

Enter the activity's official name and complete street address, including town, city or county, state and ZIP code.

If the site lacks a street address, enter the town, city or county and the latitude and longitude in degrees, minutes, seconds (DMS) to the nearest 15 seconds of the approximate center of the site (example 37° 30' 15" N 77° 20' 15" W).

**Location of Offsite Support Activities**

This permit also authorize stormwater discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) located on-site or off-site provided that: (a) The support activity is directly related to the construction site that is required to have VSMP permit coverage for discharges of stormwater associated with construction activity; (b) The support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and (c) Appropriate control measures are identified in a stormwater pollution prevention plan and implemented to address the discharges from the support activity areas.

Provide the information required for each off-site support activity seeking coverage. If an off-site support activity is going to be covered by this permit the total land area of the off-site support activity and area to be disturbed by the off-site support activity need to be included in the Estimated Area to be Disturbed (Section 8).

**Section 4 Status of Activity**

Indicate the appropriate status (Federal, State, Public, or Private) of the activity.

**Section 5 Nature of the Construction Project**

Indicate the nature of the construction project (commercial, residential, agricultural, oil and gas, etc). This list is not all inclusive.

**Section 6 Name of Receiving Water(s)**

Enter the name of the receiving water(s) for all stormwater discharge(s), including any stormwater discharges from off-site support activities to be covered under the permit. Receiving waters identified as impaired on the 2008305(b)/303(d) Water Quality Assessment Integrated Report or for which a Total Maximum Daily Load (TMDL) Waste Load Allocation (WLA) has been established for stormwater discharges from a construction site shall be noted.

**Hydrologic Unit Code (HUC)** is a watershed unit established in the most recent version of Virginia's 6th order national watershed boundary dataset.

**Section 7 Name of MS4 Operator**

If the stormwater is discharged through a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4. The name of the MS4 operator is usually the Town, City, County, Institute or Federal facility where the construction activity is located.

**Section 8 Estimated Project Start Date**

Enter the date (Month/Day/Year) the projected is expected to start.

**Estimated Project Completion Date**

Enter the date (Month/Day/Year) the project is expected to be complete.

**Section 9 Total Land Area of the Development**

Enter the total area (to the nearest one tenth acre) of the development (meaning the total acreage of the larger common plan of development or sale). Include the total acreage of any offsite support activities to be covered under the permit.

**Estimated Area to be Disturbed**

Enter an estimate of the total number of acres (to the nearest one tenth acre) to be disturbed. Include in the Estimated Area to be Disturbed the area of disturbance that will occur at off-site support activities to be covered under the permit.

**Section 10 Larger Common Plan of Development or Sale**

Indicate if the area to be disturbed by the construction activity is part of a larger common plan of development or sale. Larger common plan of development or sale defines a contiguous are where separate and distinct construction may be taking place at different times on different schedules. Plan is broadly defined as any announcement or documentation, including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, etc., or physical demarcation such as boundary signs, lot stake, and surveyor markings indicating that construction activities may occur.

**Section 11 Nutrient Offsets**

Indicate if nutrient offsets are intended to be acquired in accordance with §10.1-603.8:1 of the Code of Virginia. If the acquisition of offsets is being considered but is not certain, select "under consideration."

**Section 12** A stormwater pollution prevention plan (SWPPP) must be prepared in accordance with the requirements of the General VSMP Permit for Discharges of Stormwater from Construction Activities prior to submitting this Registration Statement. By signing this Registration Statement the operator is certifying that the SWPPP has been prepared.

**Section 13 Certification**

**The operator identified in Section 1 of this Registration Statement is responsible for certifying and submitting this Registration Statement. Please sign the form in INK.** State statutes provide for severe penalties for submitting false information. State regulations require this Registration Statement to be signed as follows:

For a corporation: by a responsible corporate officer. For the purpose of this part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this part, a principal executive officer of a public agency includes: (i) the chief executive officer of the agency or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

***The Department of Conservation and Recreation reserves the right to request additional information not directly addressed by the Registration Statement if, in its discretion, a facility or operation poses a potential impact on water quality.***

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# DEPARTMENT OF CONSERVATION AND RECREATION PERMIT FEE FORM

**Instructions:**
Applicants for an individual Virginia Stormwater Management Program (VSMP) Permit are required to pay permit application fees. Fees are also required for registration coverage under General Permits. Fees must be paid when applications for permit issuance or modification are submitted. Applications will be considered incomplete if the proper fee is not paid and will not be processed until the fee is received.

The permit fee schedule is included with this form. Fees for permit issuance, reissuance, modification and maintenance are included. Once you have determined the fee for the type of application you are submitting, complete this form. The original copy of the form and your check or money order payable to "Treasurer of Virginia" should be mailed to:

Department of Conservation and Recreation
Division of Finance, Accounts Payable
203 Governor Street, 4th Floor
Richmond, Virginia 23219

A copy of the form and a copy of your check or money order should accompany the permit registration statement (application). You should retain a copy for your records. Please direct any questions regarding this form or fee payment to SWMESquestions@dcr.virginia.gov.

**Construction Activity Operator:**

Name: Darrell Hill FIN: _____

Mailing Address: 810 Union Street

City: Norfolk State: VA Zip: 23510 Phone: 757-664-4242

**Daytime Phone Number:** (_____) _____ - _____

**Name and Location of Construction Activity:**

Name: Jamestown Crescent Culvert Replacement

Town, City, or County: Norfolk

**Type of VSMP Permit (from Fee Schedule):**

_____ MS4 Individual Permit _____ MS4 General Permit

_____ Construction Individual Permit __x__ Construction General Permit

**Type of Action:** __x__ New Issuance _____ Reissuance

_____ Modification _____ Maintenance

**Amount of Fee Submitted** (from Fee Schedule): $200.00

**Existing Permit Number** (if applicable): _____

FOR DCR USE ONLY

Date: _____ DC #: _____

(DCR 199-145) (10/09)

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# Virginia Stormwater Management Program (VSMP) Permit Fee Schedule

**A. VSMP Individual Permits.** Applications for issuance of new individual VSMP permits, and for permittee initiated major modifications that occur (and become effective) before the stated permit expiration date. [NOTE: Individual VSMP permittees pay an Annual Permit Maintenance Fee instead of a reapplication fee. The permittee is billed separately by DCR for the Annual Permit Maintenance Fee.]

| TYPE OF VSMP PERMIT | ISSUANCE | MODIFICATION |
|---|---|---|
| Municipal Stormwater / MS4 Individual (Large and Medium) | $16,000 | $5,000 |
| Municipal Stormwater / MS4 Individual (Small) | $8,000 | $2,500 |
| Construction Stormwater Individual | $15,000 | $0 |

**B. Registration Statements for VSMP MS4 General Permit Coverage.** The fee for filing a permit application (registration statement) for coverage under a VSMP MS4 stormwater general permit issued by the permit issuing authority is as follows:

| TYPE OF VSMP PERMIT | ISSUANCE |
|---|---|
| Municipal Stormwater / MS4 General Permit (Small) | $4,000 |

**C. Registration Statements for VSMP Construction General Permit Coverage.** The fee for filing a permit application (registration statement) for coverage under a VSMP Construction stormwater general permit issued by the permit issuing authority is as follows:

| TYPE OF VSMP PERMIT | ISSUANCE |
|---|---|
| Construction General / Stormwater Management - Phase I Land Clearing ("Large" Construction Activity - Sites or common plans of development or sale equal to or greater than five acres) | $500 |
| Construction General / Stormwater Management - Phase II Land Clearing ("Small" Construction Activity - Sites or common plans of development or sale equal to or greater than one acre and less than five acres) | $300 |
| Construction General / Stormwater Management – Small Construction Activity/Land Clearing (Sites within designated areas of Chesapeake Bay Act localities with land disturbance acreage equal to or greater than 2,500 square feet and less than one acre) | $200 |

**D. Permit Maintenance Fees.** The annual permit maintenance fees apply to each VSMP permit identified below, including expired permits that have been administratively continued.

| TYPE OF PERMIT | MAINTENANCE |
|---|---|
| VSMP Municipal Stormwater / MS4 Individual (Large and Medium) | $8,800 |
| VSMP Municipal Stormwater / MS4 Individual (Small) | $6,000 |
| VSMP Municipal Stormwater / MS4 General Permit (Small) | $3,000 |
| VSMP General / Stormwater Management - Phase I Land Clearing ("Large" Construction Activity - Sites or common plans of development equal to or greater than 5 acres) | $0 |
| VSMP General / Stormwater Management - Phase II Land Clearing ("Small" Construction Activity - Sites or common plans of development equal to or greater than 1 acre and less than 5 Acres) | $0 |
| Construction General / Stormwater Management – Small Construction Activity/Land Clearing (Sites within designated areas of Chesapeake Bay Act localities with land disturbance acreage equal to or greater than 2,500 square feet and less than one acre) | $0 |

# APPENDIX B

# CONTRACTOR CERTIFICATION FORMS

# CONTRACTOR CERTIFICATIONS

Jamestown Crescent Culvert Replacement
Norfolk, Virginia

The Contractor and subcontractor(s) that will implement the pollutant control measures described in the SWPPP must be identified below. Each must sign a statement certifying that they understand the VSMP general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

Contractor or subcontractor implementing the SWPPP:

_____
Business Name

_____
Business Address
_____

_____

_____
Business Telephone Number

Activities contractor or subcontractor responsible for:

CERTIFICATION:

***"I certify under penalty of law that I understand the terms and conditions of the VSMP General Permit for Discharges of Storm water from Construction Activities (VAR 10 and the SWPPP that authorizes storm water discharges associated with land disturbing activities from the construction site identified as part of this certification."***

_____ _____
Signature Date

_____
Printed Name

# CONTRACTOR CERTIFICATIONS

Jamestown Crescent Culvert Replacement
Norfolk, Virginia

The Contractor and subcontractor(s) that will implement the pollutant control measures described in the SWPPP must be identified below. Each must sign a statement certifying that they understand the VSMP general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

Contractor or subcontractor implementing the SWPPP:

_____
Business Name

_____
Business Address
_____

_____
Business Telephone Number

Activities contractor or subcontractor responsible for:

CERTIFICATION:

> ***"I certify under penalty of law that I understand the terms and conditions of the VSMP General Permit for Discharges of Storm water from Construction Activities (VAR 10) and the SWPPP that authorizes storm water discharges associated with land disturbing activities from the construction site identified as part of this certification."***

_____ _____
Signature Date

_____
Printed Name

# CONTRACTOR CERTIFICATIONS

Jamestown Crescent Culvert Replacement
Norfolk, Virginia

The Contractor and subcontractor(s) that will implement the pollutant control measures described in the SWPPP must be identified below. Each must sign a statement certifying that they understand the VSMP general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

Contractor or subcontractor implementing the SWPPP:

_____
Business Name

_____
Business Address
_____

_____

_____
Business Telephone Number

Activities contractor or subcontractor responsible for:

CERTIFICATION:

***"I certify under penalty of law that I understand the terms and conditions of the VSMP General Permit for Discharges of Storm water from Construction Activities (VAR 10) and the SWPPP that authorizes storm water discharges associated with land disturbing activities from the construction site identified as part of this certification."***

_____ _____
Signature Date

_____
Printed Name

# CONTRACTOR CERTIFICATIONS

Jamestown Crescent Culvert Replacement
Norfolk, Virginia

The Contractor and subcontractor(s) that will implement the pollutant control measures described in the SWPPP must be identified below. Each must sign a statement certifying that they understand the VSMP general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

Contractor or subcontractor implementing the SWPPP:

_____
Business Name

_____
Business Address
_____

_____

_____
Business Telephone Number

Activities contractor or subcontractor responsible for:

CERTIFICATION:

> ***"I certify under penalty of law that I understand the terms and conditions of the VSMP General Permit for Discharges of Storm water from Construction Activities (VAR 10) and the SWPPP that authorizes storm water discharges associated with land disturbing activities from the construction site identified as part of this certification."***

_____ _____
Signature Date

_____

# APPENDIX C

# SAMPLE INSPECTION REPORT

# CITY OF NORFOLK VIRGINIA
## CONSTRUCTION SITE STORM WATER GENERAL PERMIT
## LAND DISTURBANCE INSPECTION REPORT

**Project Name: Jamestown Crescent Culvert Replacement** **CIP#:**_____

**Location: Jamestown Crescent Ave, VA 23508**

**Contractor/Operator:** _____ **Anticipated Completion Date:**_____

**Inspection Date/Time:**_____ **Inspector:** _____

**Inspector DCR Certification Type/#**_____ **Weather:** _____

**Stage of Construction: _____Pre-Construction Conference _____Clearing and Grubbing _____Rough Grading**

**____Finish Grading _____ Construction of SWM Facilities _____ Maintenance of SWM _____Final Stabilization**

**_____ Excavation ____ Other Land Disturbance Activity – please specify:** _____

**Reason for Inspection: _____ Regular _____ Pre-Storm Event _____ During Storm Event _____ Post-Storm Event**

**Has a sediment discharge occurred since the last inspection? YES/NO Is the site in compliance? YES/NO**

| ITEM # | POLLUTANT CONTROL | IMPLEMENTED | IN COMPLIANCE | DATE CORRECTED | ACTION TO BE TAKEN/NOTES |
|---|---|---|---|---|---|
| 1 | SWPPP located on-site with all E&S changes documented? | YES/NO/NA | YES/NO/NA | | |
| 2 | Construction entrance | YES/NO/NA | YES/NO/NA | | |
| 3 | Sediment barriers | YES/NO/NA | YES/NO/NA | | |
| 4 | Storage/ disposal areas | YES/NO/NA | YES/NO/NA | | |
| 5 | Sediment traps | YES/NO/NA | YES/NO/NA | | |
| 6 | Check dams | YES/NO/NA | YES/NO/NA | | |
| 7 | Inlet protection | YES/NO/NA | YES/NO/NA | | |
| 8 | Silt Fence | YES/NO/NA | YES/NO/NA | | |
| 9 | Diversion Dike(s) | YES/NO/NA | YES/NO/NA | | |
| 10 | Tree Protection | YES/NO/NA | YES/NO/NA | | |
| 11 | Temporary stabilization of denuded areas? | YES/NO/NA | YES/NO/NA | | |
| 12 | Stockpiles stabilized or BMPs in place? | YES/NO/NA | YES/NO/NA | | |

| | | | | | |
|---|---|---|---|---|---|
| 13 | Permanent stabilization provided within 14 days of activity? | YES/NO/NA | YES/NO/NA | | |
| 14 | Is permanent stabilization adequate? | YES/NO/NA | YES/NO/NA | | |
| 15 | Turbidity curtains installed and maintained? | YES/NO/NA | YES/NO/NA | | |
| 16 | Public roadways free of debris? | YES/NO/NA | YES/NO/NA | | |
| 17 | Discharge points free of sediment deposits at receiving waters? | YES/NO/NA | YES/NO/NA | | |
| 18 | Natural resources protected with BMPs? | YES/NO/NA | YES/NO/NA | | |
| 19 | Trash/Litter collected & dumpsters covered? | YES/NO/NA | YES/NO/NA | | |
| 20 | Vehicle and equipment fueling, cleaning, & maintenance areas free of spills, leaks, and other deleterious material? | YES/NO/NA | YES/NO/NA | | |
| 21 | Fuel tanks in accordance with SWPPP, permit, containment and spill control requirements? | YES/NO/NA | YES/NO/NA | | |
| 22 | Any spills since last inspection? | YES/NO/NA | YES/NO/NA | | |
| 23 | Washout facilities clearly marked and maintained? | YES/NO/NA | YES/NO/NA | | |
| 24 | Wash water dewatering discharges properly controlled? | YES/NO/NA | YES/NO/NA | | |
| 25 | Dewatering structures/sediment trapping devices in place? | YES/NO/NA | YES/NO/NA | | |
| 26 | Are all applicable regulations for working in or crossing live watercourses being met? | YES/NO/NA | YES/NO/NA | | |
| 27 | Are utility trenches stabilized properly? | YES/NO/NA | YES/NO/NA | | |
| 28 | Have all temporary control structures that are no longer needed been removed? | YES/NO/NA | YES/NO/NA | | |
| 29 | Have all control structure repairs and sediment removal been performed? | YES/NO/NA | YES/NO/NA | | |
| 30 | Is a sign located near the site entrance displaying the permit cover letter? | YES/NO/NA | YES/NO/NA | | |

| | | | | | |
|---|---|---|---|---|---|
| 31 | Is a rain gauge located on-site? | YES/NO/NA | YES/NO/NA | | |

**CORRECTIVE ACTIONS TO BE TAKEN:** (Explain each "NO" circled above)

**COMMENTS:**

Based on the results of the inspection, if any existing controls need modified, or if any new controls need to be installed, implementation shall be *completed before the next anticipated storm event or within 7 calendar days* of inspection. This report will be kept on file by the City of Norfolk on behalf of the Contractor as part of the Storm Water Pollution Prevention Plan for at least **3 years** from the date of completion and submission of the Notice of Termination.

**Certification Statement**

I certify under penalty of law that I have read and understand this document and the document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name and Title:_____
(Contractor)

Signature: _____Date/Time: _____
(Contractor)

Print Name and Title Certification Type and Number: _____
(Inspector)

Signature: _____Date/Time: _____
(Inspector)

**Notice Given To:**_____ **Date/Time (A.M. /P.M.):**_____
**Name / Title**

**Notice Given By:** _____
**Name / Title / Department**

**Corrections Performed by Contractor:** _____
**Name / Title / / Date**

**Corrections Accepted by Inspector:** _____
**Name / Title / Department / Date**

**Corrections Accepted by Project Manager:**_____
**Name / Title / Department / Date**

# APPENDIX D

# NOTICE OF TERMINATION

Two copies of the Notice of Termination shall be completed by the Contractor when construction activities that disturb site soil have been completed and the site has achieved final stabilization. In addition, a list of permanent storm water Best Management Practices (BMP) installed on site must be prepared. For each permanent BMP, the following information must be submitted: name of the BMP (i.e. Permanent Wet Pond 1; Hydrodynamic Separator 1; Oil Water Separator 1; Permanent Seeded Area, etc.), the site acreage treated by the BMP, the name of the waterbody receiving runoff treated by the BMP, and the 8-digit Hydrologic Unit Code (HUC) of the receiving waterbody receiving runoff treated by the BMP. The 8-digit HUC will be provided by the Owner to the Contractor.

One NOT shall be forwarded to the City of Norfolk Storm Water Program Administrator. The other NOT shall be included in the final pay request submitted to the Owner. The Owner Project Inspector will forward a Notice of Termination to the Virginia Department of Conservation and Recreation when, in the sole judgment of the Owner Project Inspector, the site has achieved final stabilization as defined in the Virginia Erosion and Sediment Control Law and Regulations and this Permit.

Termination of coverage becomes effective at midnight on the date the Notice of Termination is submitted to the VDCR.

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# VSMP General Permit Notice of Termination - Construction Activity Stormwater Discharges (VAR10)

**(Please Type or Print All Information)**

1. **Construction Activity Operator:**

   Name:_____

   Mailing Address:_____

   City:_____ State:_____ Zip:_____ Phone:_____

2. **Name and Location of Construction Activity** (As listed on registration statement)**:**

   Name: Jamestown Culvert Replacement

   Address: 820 Jamestown Crescent Ave

   City, Town or County: Norfolk State: VA Zip: 23508

   If street address unavailable: Latitude 36°-53'-34" W Longitude 76°-17'-45" W

3. **VSMP Stormwater General Permit Number:** _____

4. **The Reason for Terminating Coverage Under the General Permit** (The construction activity operator may only submit a Notice of Termination after one or more of the conditions below have been met)**:**
   - ❑ **Necessary post-construction control measures included in the SWPPP for the site are in place and functioning effectively and final stabilization has been achieved on all portions of the site for which the operator is responsible;**
   - ❑ **Another operator has assumed control over all areas of the site that have not been finally stabilized and obtained coverage for the ongoing discharge;**
   - ❑ **Coverage under an alternative VPDES or VSMP permit has been obtained; or**
   - ❑ **For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.**

***The Notice of Termination must be submitted within 30 days of one of the above conditions being met. Authorization to discharge terminates at midnight on the date that the Notice of Termination is submitted.***

5. **Permanent Control measures Installed:** Attach a list of permanent control measures (both structural and non-structural) that will be installed at the construction site. For each BMP, include the following information: (a) Type of control measure installed and the date that it became functional as a permanent control measure; (b) Geographic location (county or city and Hydrologic Unit Code) (latitude and longitude may additionally be included if available); (c) Waterbody the control measures discharge into; and, (d) Number of acres that will be treated (to the nearest one-tenth of an acre). If no permanent control measures were installed please check this box ❑
6. **Participation in a Regional Stormwater Management Plan:** Where applicable, attach the following information related to participation in a regional stormwater management plan: (a) type of regional facility or facilities to which the site contributes; (b) geographic location of any regional facility to which the site contributes (county or city and Hydrologic Unit Code); (c) geographic location of the site (county or city and Hydrologic Unit Code) (latitude and longitude may additionally be included if available); and (d) number of acres treated by a regional facility.
7. **Nutrient Offsets:** Where applicable, attach the following information related to nutrient offsets that were acquired in accordance with §10.1-603.8:1 of the Code of Virginia: (a) name of the broker from which offsets were acquired; (b) geographic location (county or city and Hydrologic Unit Code) of the broker's offset generating facility; (c) number of nutrient offsets acquired (lbs. per acre per year); and (d) nutrient reductions achieved on site (lbs. per acre per year).
8. **Certification:**
   "I certify under penalty of law that I have read and understand this notice of termination and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

   Print Name: _____ Title: _____

   Signature:_____ Date:_____

**(Please sign in INK. The person signing this form must be authorized to sign on behalf the operator identified in Item #1 above.)**

Mail to: Department of Conservation and Recreation
Stormwater Permitting
203 Governor Street, Suite 206
Richmond, VA 23219

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# INSTRUCTIONS for FORM DCR 199-147

## VSMP General Permit Notice of Termination - Construction Activity Stormwater Discharges

**General**

A VSMP General Permit Notice of Termination must be submitted when an operator no longer wishes to be covered under the VSMP General Permit for Stormwater Discharges from Construction Activities.

Mail to: Department of Conservation and Recreation
Stormwater Permitting
203 Governor Street, Suite 206
Richmond, VA 23219

**Section 1 Activity Operator Information**

Give the legal name of the person, firm, public organization, or any other entity that was issued the general permit for the site described in this Notice of Termination. Do not use a colloquial name. Enter the complete address and phone number of the operator.

**Section 2 Activity Location Information**

Enter the activity's official name and complete street address, including city, state and ZIP code. If the activity or site lacks a street address, indicate the latitude and longitude to the nearest 15 seconds of the approximate center of the site.

**Section 3 Permit Information**

Enter the existing VSMP Stormwater General Permit number assigned to the activity or site identified in Section 1 that the operator wishes to be terminated.

**Section 4 Reason for Termination**

Check the appropriate statement indicating the reason for submitting this Notice of Termination. The Notice of Termination may only be submitted after one or more of the following conditions have been met:

1. Necessary post-construction control measures included in the SWPPP for the site are in place and functioning and final stabilization has been achieved on all portions of the site for which the operator is responsible;
2. Another operator has assumed control over all areas of the site that have not been finally stabilized;
3. Coverage under an alternative VPDES or VSMP permit has been obtained; or
4. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

The Notice of Termination must be submitted within 30 days of one of the above conditions being met. Authorization to discharge terminates at midnight on the date that the Notice of Termination is submitted.

**Section 5 Permanent Control Measures Installed**

Attach a list of the permanent control measures (both structural and non-structural) that will be installed at the construction site. For each control measure, include the following information:

(a) Type of control measure installed
(b) Geographic location (county or city and Hydrologic Unit Code)
(c) Waterbody the control measure discharge into
(d) Number of acres that will be treated (to the nearest one-tenth of an acre)

Check the box if no permanent control measures were installed.

**Section 6 Participation in a Regional Stormwater Management Plan**

Where applicable, attach the following information related to participation in a regional stormwater management plan: (a) type of regional facility or facilities to which the site contributes; (b) geographic location of any regional facility to which the site contributes (county or city and Hydrologic Unit Code); (c) geographic location of the site (county or city and Hydrologic Unit Code) (latitude and longitude may additionally be included if available); and (d) number of acres treated by a regional facility.

**Section 7 Nutrient Offsets**

Where applicable, attach the following information related to nutrient offsets that were acquired in accordance with §10.1-603.8:1 of the Code of Virginia: (a) name of the broker from which offsets were acquired; (b) geographic location (county or city and Hydrologic Unit Code) of the broker's offset generating facility; (c) number of nutrient offsets acquired (lbs. per acre per year); and (d) nutrient reductions achieved on site (lbs. per acre per year).

**Section 8 Certification**

State statutes provide for severe penalties for submitting false information on this Notice of Termination.

State regulations require this Notice of Termination to be signed as follows:

For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (1) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (2) the manager of one or more manufacturing, production, or operating facilities provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, Federal, or other public facility: by either a principal executive officer or ranking elected official.

***The Department of Conservation and Recreation reserves the right to request additional information not directly addressed by the registration statement if, in its discretion, a facility or operation poses a potential impact on water quality.***

# APPENDIX E

# RECORD OF STABILIZATION AND CONSTRUCTION ACTIVITY DATES

# SITE STABILIZATION and CONSTRUCTION ACTIVITY DATES

A record of dates when land disturbing activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained by the Contractor until final site stabilization is achieved and the Notice of Termination is filed. The dates can be entered in the following form, or on a different form. A differing form must be approved in writing by the Owner, prior to use.

**LAND DISTURBING ACTIVITIES**

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

**LAND DISTURBING ACTIVITIES contd.**

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

Description of Activity: _____

Begin (date): _____ Site Contractor: _____

Location: _____

End (date): _____

# APPENDIX F

## SWPPP CONSTRUCTION SITE NOTICE AND SITE SPECIFIC VSMP PERMIT AUTHORIZATION FROM THE VIRGINIA DCR

**The SWPPP Construction Site Notice must be completed and be made weather proof by lamination or other means by the Contractor and prominently posted by the Contractor in a manner so as to be readable from a public right-of-way at the job site. The size of the SWPPP Construction Site Notice shall not be less than 8.5" x 11".**

**The project-specific VSMP Permit Authorization for the construction site shall be made weather-proof by lamination or other means by the Contractor and prominently posted by the Contractor with the SWPPP Construction Site Notice.**

# SWPPP CONSTRUCTION SITE NOTICE

## FOR THE
## VSMP GENERAL PERMIT

| | |
|---|---|
| **City Project Name and Number:** | |
| **City Project Inspector Contact Information:** | _____ Name<br>_____ Office Phone Number<br>_____ Cell Phone Number |
| **Contractor Name & Number:** **(both Site Superintendents)** | _____ Name<br>_____ Phone Number |
| **Project Description:** | |

APPENDIX G

BLANK SPILL REPORT FORM

SAMPLE OF COMPLETED SPILL REPORT FORM

**Spill Report Forms shall be completed for ALL spills of petroleum, oils, lubricants or other chemicals to soil or water during the duration of the project. Completed spill reports shall be maintained in the SWPPP.**

**Spill Report Form**

Spill Reported by: _____

Date/Time Spill: _____ Date/Time Spill PW Engineering: _____

Describe spill location and events leading to spill: _____

_____

Material spilled: _____

Source of spill: _____

Amount spilled (gallons): _____ Amount spilled to drain/waterway: _____

Containment or clean up action: _____

_____

_____

Approximate depth of soil excavation: _____

List Injuries or Personal Contamination: _____

Action to be taken to prevent future spills: _____

_____

Modifications to the SWPPP, including required sampling, necessary due to this spill: _____

_____

Agencies notified of the spill: _____

If required, date letter sent to notified agencies: _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

SWPPP Program Administrator Date

**Spill Report Form**

Spill Reported by: I.M. SORRY

Date/Time Spill: 5.27.2011 / 3:30pm Date/Time Spill PW Engineering: 5.27.2011 / 4:00pm

Describe spill location and events leading to spill: Beside Sediment Basin #1. Fueling excavator and accidentally overfilled fuel tank.

Material spilled: Diesel Fuel

Source of spill: Mobile tanker truck

Amount spilled (gallons): ±5 gallons Amount spilled to drain/waterway: 0 gallons

Containment or clean up action: Stopped filling equipment. Used absorbant pads to clean up excavator. Dug up stained soil and placed in 55 gallon drum for offsite disposal. Drum at laydown area awaiting pick up.

Approximate depth of soil excavation: 1.5 feet

List Injuries or Personal Contamination: Fuel truck operator splashed by diesel fuel / no injury.

Action to be taken to prevent future spills: Remind operators to personally monitor all refueling of their equipment. Perform fueling at designated fueling area.

Modifications to the SWPPP, including required sampling, necessary due to this spill: No sampling required Spill form added to Appendix H. Keep oil absorbants closer to fuel sites

Agencies notified of the spill: City of Virginia Beach Dept. of Public Works

If required, date letter sent to notified agencies: N/A

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SWPPP Program Administrator Date