TECHNICAL SPECIFICATIONS

DBP Remediation & Water Improvements – Phase II

February 2025

Prepared for:
TOWN OF HURT, VIRGINIA
533 Pocket Road, Hurt, VA 24563
Gary Hodnett, Mayor

Prepared by
PEED & BORTZ, LLC
Civil and Environmental Engineers
20 Midway Plaza Drive
Christiansburg, Virginia
JN: 20-13

SECTION 01100 – SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Town of Hurt – DBP Remediation & Water Improvements – Phase II

1. Project Locations:
   a. Division I: Water main installation between 797 Main Street, Hurt, VA and 508 Lynn Street, Hurt, VA with installation of a PRV Vault near 361 Main Street, Hurt, VA.
   b. Division II: Pump Station modifications and Grit Road Vault modifications near 102 Ricky Van Shelton Drive, Hurt, VA. Includes water main installation along Rickey Van Shelton Drive from the Altavista Water Treatment Plant to the Hurt Pump station.
   c. Division III: Tank mixing system installation at the Town of Hurt elevated potable water storage tank at 200 Cemetery Road, Hurt, VA.

2. Owner: Town of Hurt, Gary Hodnett, Mayor
   533 Pocket Road
   Hurt, VA 24563

B. Engineer Identification: The Contract Documents, dated February 2025 were prepared for this Project by Peed & Bortz, LLC, Civil and Environmental Engineers, 20 Midway Plaza Drive Ste. 100, Christiansburg, VA 24073.

C. Work:
1. Division I work consists of constructing approximately 1000 feet of 12 inch ductile iron waterline connecting with a dry tee installation on Main Street through to a wet tap tee for a 6” water main on Lynn Street. Water main will be installed through a 24” steel casing under US 29 Business (Main Street) and under the Norfolk Southern railroad. Work will also include the installation of a new PRV vault on Main Street connecting to an existing 8” dead water main and a dry tee on the existing 10” water main.

2. Division II work consists of constructing approximately 660 feet of 12 inch ductile iron waterline and modifications to the existing Town of Hurt Pump Station. The water main will be installed along Ricky Van Shelton Drive from the existing Town of Hurt Pump Station to the Town of Altavista Water Treatment Plant (WTP). The Town of Altavista existing 12” water main will be wet tapped at the WTP driveway. Work will also include the modifications to the Town of Hurt water meter vault to the Pittsylvania County Grit area.

3. Division III work consists of constructing the installation of a mixing and aeration system at the existing Town of Hurt elevated water tank.

1.3 CONTRACT

A. Project will be constructed under three contracts.

1.4 WORK SEQUENCE

A. General: Each Division of the Work will be constructed in one phase. See additional requirements and information regarding timing of work noted in this specification and in the contract documents.

B. Division III Contractor may opt to delay installation of the mixing and aeration system until the completion of the Division II work at the pump station. When completed, the Division II work would allow taking the water tank off-line while maintaining pressure in the water system with VFDs on the new pumps. **No additional payment will be made by the Owner to the Division III Contractor for delays or any costs (material, labor, equipment, etc.) associated with delaying the installation of the Division III work.**

1.5 USE OF PREMISES

A. In order to minimize disruption of service at the Town of Hurt tank, pump station and Grit vault, the contractor will be required to coordinate all work and water service disruptions with Town staff.

B. In order to minimize disruption of service at the Hurt WTP, the contractor will be required to coordinate work with WTP staff.

C. Unless easements or property delineations are shown on the plans, all work will be performed on existing Town of Hurt property.

D. VDOT Land Use Permit: Division I and Division II required.

E. Owner is responsible for providing all potable water for the Contractor's needs in regard to the testing and disinfection of the work. Contractor will coordinate any potable water needs or temporary metering with Town of Hurt staff.

F. Contractor and sub-contractors are responsible for compliance with Town of Hurt and Town of Hurt Drug-free workplace and non-discrimination requirements. Contractor and sub-contractors may obtain copies of these requirements from the Town of Hurt and Town of Hurt.

1.6 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "Master Format" numbering system.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.7 RECORD DRAWINGS

A. General: The Contractor will submit to the Engineer at the Final Completion inspection, record drawings of the project. Engineer will provide Contractor with one set of reproducible plan sheets upon request. The record drawings provided to the Engineer will be in a legible, reproducible format and show all revisions/changes to the plans made during construction, including horizontal and vertical location changes.

B. As-built locations of all valve box/manhole/junction box tops and any other above grade appurtenances will be provided in State Plane coordinates with an accuracy of +/- 0.25 foot. As-built elevations of all inverts and tops of manholes will be provided in State Plane coordinates with an accuracy of +/- 0.02 foot. Elevations will be surveyed at the completion of the project by a Virginia certified Land Surveyor or if agreed upon in advance by the Owner, the Contractor may provide data via another pre-approved collection method.

1.8 MATERIAL TESTING

A. Concrete testing: The Contractor will provide an approved testing agency to test concrete in accordance with the Specifications.

B. Earthwork and aggregate material testing: The Contractor will provide an approved testing agency to test earthwork and aggregate material in accordance with the Specifications.

1.9 SCHEDULE OF VALUES

A. Schedule of Values: The Contractor will provide a suitable schedule of values for each lump sum bid item citing estimated material quantities and the associated unit costs. The schedule of values will be presented to the Engineer at the pre-construction conference for the Engineer’s approval.

1.10 CONSTRUCTION STAKING

A. General: The Contractor will be responsible for providing all construction staking and all other surveying needs.

1.11 CLEARING AND EROSION CONTROL

A. General: The Contractor will be responsible for complying with all provisions of the erosion and sediment control measures shown on the plans and notes including the construction, installation and maintenance of all mechanical and vegetative erosion and sediment control measures for the duration of the project. If unforeseen erosion or sediment problems arise during the construction, the Contractor will implement corrective measures acceptable to the Inspector or Engineer.

1.12 PERMITS

A. Erosion Control Permit: Contractor will be responsible for compliance with the erosion control noted on the plans and specifications. Contractor will be responsible for obtaining the permit from Pittsylvania County. Owner will be responsible for any payment required for the permit fee.

B. VDOT LUP Permit: Contractor will be responsible for applying for and obtaining the LUP through VDOT for the Division I and Division II work. Contractor will be responsible for permit fee and the LUP Bond.
   1. Division I: Permit Fee- $170 VDOT Bond-$10,000
   2. Division II: Permit Fee-$170 VDOT Bond- $30,000

C. Building Permit: Contractor will be responsible for applying for and obtaining the Building Permit through Pittsylvania County for the Division II work. Owner will be responsible for permit fee.

D. Norfolk Southern Railroad Crossing Permit: Owner will be responsible for permit fee. Contractor will be responsible complying with the permit requirements **including the additional insurance requirements and NS flagmen requirements.**

E. VSMP Permit: Not required.

1.13 WATER MAIN TESTING

A. General: The Owner will provide a volume of water equal to 1.5 times the volume of the line for pressure testing of the line. Any additional water required by the Contractor may be purchased from the Town of Hurt Utility Department.

B. Contractor will coordinate filling the mains with Town staff. Contractor is responsible for installing (and properly abandoning) any additional taps, temporary piping, pumps, flushing appurtenances, dechlorination of flushing water, etc., as required to property test the water mains.

1.14 BLASTING

A. Blasting will not be permitted on the site.

1.15 OSHA REQUIREMENTS

A. General: The Contractor will be responsible for performing all excavation, pipe installation and backfilling in accordance with the 1990 OSHA Excavation Standards 29 CFR Part 1926, Subpart P. The Contractor's responsibility also extends to providing a "Competent Person" as defined by the OSHA regulation referenced above on the job site.

1.16 TRAFFIC AND PARKING

A. Coordinate all access and parking with Town staff prior to commencing work or storing materials at any of the Town sites. A marshal area/laydown yard area will be provided on the Town owner property off Lynn Street, the tank site and the pump station site. Contractor will be responsible for returning the laydown area to pre-construction conditions when complete.

1.17 PRE-CONSTRUCTION AUDIO-VISUAL SURVEY

A. Prior to starting construction, Contractor shall perform an audio-visual survey of the project site. Record shall be printed on new, high-resolution color videotape. Video display will show location, description of existing structures and landscaping, including time, date, address, and compass direction of travel and view. Footage shall be correlated to plan sheet stationing. Vulnerable, damaged, or deteriorated areas within the zone of influence will be shown. Travel speed shall be approximately 50 ft/min. with a mini-

mum camera elevation of 5 feet over the work with a minimum 30-foot width showing construction area. Recording must be compatible with standard DVD or PC computer files. Contractor shall provide copies to the Engineer and Owner at the Pre-construction Conference. Contractor shall provide a remake of any DVD not to the Engineer's and Owner's satisfaction. The first partial payment request will not be processed until any acceptable tape is provided by the Contractor.

1.18 BURNING

A. Contractor may burn brush provided contractor complies with all local, state and federal regulations. Contractor will obtain all permissions required to burn debris on private lands and restoration of area when complete. Burning debris and associated activities will be at no additional cost to the Owner. Contractor will obtain permission from the Town of Hurt prior to any burning.

1.19 FENCING

A. Contractor will replace (in-kind or better) or repair all disturbed fencing.

1.20 PROCESS DOWNTIME SCHEDULING

A. Contractor will coordinate with Town of Altavista WTP for best timing for wet-tapping the 12" pressurized Town of Altavista waterline.

1.21 REMOVED EQUIPMENT

A. Contractor will remove and safely transport any equipment to be removed and as identified by the Owner to a location identified on the site. Contractor will take adequate care not to damage equipment to be removed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

SECTION 01270 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

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

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: The Bid in Section 5.01 of the Bid Form consists of Unit Price bid items. The general scope of work included in these bid items is included at the end of this Section.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A list of unit prices is included at the end of this Section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Bid Items:

1. Mobilization: Mobilization will not be measured but will be considered as a lump sum payment limited to the percentage noted on the bid/agreement form. Project sign (if required) shall be included in mobilization bid item.

2. Water Main: Water mains will be measured in linear feet for each size and type installed. Measurement will be horizontally through all valves and fittings and will be paid for at the contract unit price per linear foot for each size of pipe specified and to the points noted on the plans. This price will include compensation for all labor, materials, tools, equipment, and incidentals necessary to complete this work in accordance with these specifications. This unit price also includes installing waterline in casings. Casing installation will be paid under a separate line item.

3. Steel Casing: Steel casing pipe will be measured and paid for per linear foot for size and type installed. This unit price will include casing pipe installation, carrier pipe installation within the casing, and other associated work items according to the drawing details. Carrier pipe will be paid under the water line item. This price will include compensation for all labor, materials, tools, equipment, insurance, permitting, flagmen, coordination costs, spacers, excavation and backfill of boring pits, and incidentals to complete the work in accordance with these specifications, Norfolk Southern requirements and VDOT traffic control requirements. Unit price will include up to three (3) attempts at three different locations per bore per VDOT requirements. If the Contractor is unable to bore due to rock after three attempts or if VDOT allows open-cutting prior to the 2nd or 3rd attempt, the Contractor will open cut and proceed with construction according to the documents. Unit price for this bid item shall also apply in the event casing pipe is installed by open cut, in which case backfill and pavement materials will be included in this pay item. Contractor will be paid for the linear footage of steel casing abandoned under the roadway at failed bore attempts. All abandoned casing will be abandoned per VDOT requirements at no additional cost to the Owner. Payment length of casing will extend 36” beyond the edge of pavement, back or curb, or outside of sidewalk unless otherwise specified on the plans. Payment length of casing will extend 60” beyond the edge of pavement for the US Business 29.

4. Fire Hydrant (Complete): Hydrants will be measured by the number and type of each installed and paid for at the contract unit price per each. This price will include hydrant, 6” gate valve, main line x” x 6” tee, hydrant base elbow, up to 20 lf of 6” DIP for hydrant lead and incidentals. In addition, the price will be full compensation for excavation, backfill with suitable material, compaction, connections, concrete blocking, tie rods, crushed stone drain, disposal of surplus or unsuitable materials, restoration of property, testing, and for furnishing all labor materials, tools, equipment and incidentals necessary to complete the work. All joint restraints on the branch side of the mainline tee to the hydrant will be considered incidental to this line item.

5. Valves: Valve price shall include box & lid and will be measured by the number of each size installed and will be paid for at the contract unit price for each size specified. This price will be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to complete the work.

6. Wet Tap Valve & Sleeve: Wet tap valve and sleeve will be measured by the number of each size installed and will be paid for at the contract unit price for each size specified. This price shall be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to tap the existing waterline and complete the work.

7. Fittings: Pipe fittings, couplings, reducers, tees, elbows, plugs, crosses and similar connectors will be paid for per weight for standard ductile iron fittings. Mechanical joint fittings include a wedge type restraint gland (Megalug or similar) in lieu of a standard MJ gland. Fittings and connectors smaller than 4” diameter will not be paid for under this item but will be considered incidental to the pipe line item. The weight used for payment will be per the chart included at the end of this section. Contractor has the prerogative to utilize compact fittings at no additional compensation or increase in the contract price.

8. Joint Restraint: Joint restraints will be paid for per size per each as installed. Restraints installed on the branch run of a mainline tee will be considered incidental to the fire hydrant price and will not be paid for under this line item. This price shall be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to complete the work.

9. Air Release Valve: Air Release Valve price will be measured and paid per each type installed and shall include a vault or box with frame & cover. Price will include main line saddle, corp stop, any piping/nipples and ball valve under ARV unit. Copper service tubing from the corp stop to the box will be included for the cut slope installation. This price will include compensation for all

labor, materials, tools, equipment, unclassified excavation, and incidentals necessary to complete this work as shown on the plans and in accordance with these specifications.

10. Pressure Reducing Valve (PRV): PRV pay item shall include a concrete vault, PRVs, piping, connections to existing piping, and miscellaneous appurtenances per the contract documents and detailed on the plans. This work shall be paid for as a lump sum bid item and shall include all labor, materials, tools, equipment, and incidentals necessary to complete this work in accordance with these specifications.

11. Driveway Crossing: Driveway Crossing will be measured and paid per linear foot of pipeline installed within gravel, asphalt or concrete driveway or gravel roadway pavement. Gravel driveway and roadway will be backfilled completely with stone. Asphalt will be installed to match existing asphalt depth and backfilled completely with gravel. Concrete driveway will be installed to match existing concrete depth & reinforcement and backfilled completely with gravel. This price will include compensation for all labor, stone trench backfill, materials, tools, equipment, unclassified excavation, and incidentals necessary to complete this work as shown on the plans and in accordance with these specifications.

12. Gravel Backfill Within Shoulders: Gravel Backfill within Shoulders will be measured and paid per linear foot of pipe installed and shall include gravel, compaction, traffic control and any other incidentals required to properly install VDOT approved gravel mix backfill of the excavated trench area from springline of pipe to finished grade. This price will include compensation for all labor, materials, tools, equipment, unclassified excavation, disposal of excavated material, and incidentals necessary to complete this work as shown on the plans and in accordance with these specifications.

13. Silt Fence: This item will be measured and paid per linear foot as installed. This price will include compensation for all labor, materials, tools, equipment, excavation, backfill, compaction and incidentals necessary to complete this work in accordance with these specifications. Incidentals included with this line item are trenching, maintenance of silt fence, removal and disposal of accumulated silt, and any other incidental as may be required to properly install and maintain this item. Additional silt fence required by Town of Hurt erosion control or VDOT due to the Contractor not complying with the contract documents will not be paid for by the Owner. Additional silt fence required by Town of Hurt erosion control or VDOT while the Contractor has complied with the contract documents will be paid for under this item.

14. Erosion Control (EC-2) matting: This item will be measured and paid per linear foot as installed per disturbed width to coincide with pipeline construction. This price will include compensation for all labor, materials, tools, equipment, excavation, backfill, compaction and incidentals necessary to complete this work in accordance with these specifications and per VDOT standards. Additional matting required to be installed by VDOT, the Inspector or the Town of Hurt E&S will be paid for at the associated unit price.

15. Pump Station: This item will be measured and paid as lump sum installed. This price will include compensation for all labor, materials, tools, equipment, excavation, backfill, compaction and incidentals necessary to complete the Division II work within the pump station. Water main outside of the building will be paid for under the appropriate line item. Work associated with this line item includes (but is not limited to) all building modifications, pumps, piping, pump control panels, painting, sealing, wiring internal appurtenances, all electrical elements, electrical modifications, piping within and under the building and any other item associated with the booster station and not itemized in unit prices in accordance with these specifications. Incidentals included with this line item are any other incidental as may be required to properly construct this item.

16. Meter Vault Modifications: This item will be measured and paid as lump sum installed. This price will include compensation for all labor, materials, tools, equipment, excavation, backfill, compaction and incidentals necessary to complete the Division II work at the Grit Meter vault. Work associated with this line item includes (but is not limited to) all vault modifications, relocation of equipment, meters, piping, tanks, check elements, valves, fittings, rodding/restraints, couplers, spool pieces, flange adaptors, pipe stands/supports, painting, sealing and any other item associated with the booster station and not itemized in unit prices in accordance with these specifications. Incidentals included with this line item are any other incidental as may be required to properly

construct this item. SCADA monitoring equipment and materials associated with the meter vault will be paid for under the SCADA line item.

17. Tank Mixing & Aeration System: Tank Mixing & Aeration System lump sum pay item will include all materials, grading, construction, excavation, labor, tools, equipment and incidentals necessary to complete this work in accordance with the contract documents. Pay item will include all piping, valves, fittings, & other appurtenances in and around the tank. All grading, excavation, backfill, seeding, stabilization, site piping, conduit, and any item not specifically identified as a separate line item will be considered as part of this pay item.

18. SCADA: This item will be measured and paid as lump sum installed per Division work. This price will include compensation for all labor, materials, tools, equipment, and incidentals necessary to complete the SCADA system for the associated Division work including wiring internal appurtenances, all electrical elements, and any other item associated not itemized in unit prices in accordance with these specifications. Incidentals include any other incidentals as may be required to properly construct and install this item.

B. Related Items:

1. Clearing and Grubbing: All necessary clearing and grubbing is to be considered incidental to the other items of work and no separate payment or additional compensation will be made.

2. Rock: Rock and its excavations will be considered subsidiary to the work and will not be measured for separate payment. No additional payment will be made for the excavation and disposal of rock.

3. Unsuitable Material: No additional payment will be made for unsuitable material excavation, disposal, or excavation & compaction of suitable material required to backfill unsuitable material excavations.

4. Pipe Select Backfill Material: Where necessary, select backfill material for pipe installation will be considered incidental to the work and will be obtained from approved sources to replace unsuitable backfill material encountered or materials excavated under paved areas including driveways. No additional payment or additional compensation will be made for this item.

5. Seeding: All necessary seeding, including fertilizer, lime, topsoil preparation, and mulch in accordance with the specifications, will be considered incidental to the other items of work and no separate payment or additional compensation will be made.

6. Protection of existing asphalt pavement: All measures and materials utilized by the Contractor to prevent damage to existing asphalt pavement will be considered incidental to the other items of work and no separate pavement or additional compensation will be made.

7. Erosion Control Measures: All erosion control measures not specified as payment line items will be considered incidental to the work and no additional payment will be made. Maintenance, repair, replacement of damage erosion control measures and removal of installed measures will be considered incidental to the work and no additional payment will be made.

8. Fencing: All fence repair or removal & construction will be considered incidental to the work and no separate payment or additional compensation will be made.

9. Traffic Control: All documentation, material, equipment, and labor required for proper traffic control per VDOT requirements will be considered incidental to the other items of work and no separate payment or additional compensation will be made.

10. Ditch repair: All equipment and labor required for the repair/re-establishment of rip-rap or grass lined ditches including residential driveway culverts will be considered incidental to the other items of work and no separate payment or additional compensation will be made.

11. VDOT Inspection: Any VDOT inspection fees will be considered incidental to the other items of work and no separate payment or additional compensation will be made.

12. Guardrail repair: Any repair/replacement or temporary dismantling of existing guardrail required will be considered incidental to the other items of work and no separate payment or additional compensation will be made.

13. Temporary utility pole shoring: Any temporary shoring of existing utility poles or any other coordination efforts/charges/fees with utility companies required will be considered incidental to the other items of work and no separate payment or additional compensation will be made.

14. Testing and Disinfection: All water line testing and disinfection is to be considered incidental to the other items of work and no separate payment or additional compensation will be made.

15. Record Drawings: Record Drawings will be considered part of the mobilization bid item, and will not be measured nor paid for separately.

END OF SECTION 01270

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: The Contractor shall provide submittals for the Engineer's approval to show compliance with the specifications. Unacceptable submittals shall be revised and resubmitted as necessary until compliance with the specifications is achieved.

B. Related Section: Additional Sections of the Documents which are referenced in this Section include:

1. Section 00710 – General Conditions

1.2 QUALITY ASSURANCE

A. Coordination of Submittals: The Contractor shall be responsible for reviewing the Specifications to ensure that the items being submitted conform in all respects with the requirements. All submittals shall be provided to the Engineer at least 3 weeks prior to commencing work on the items being submitted.

B. Substitutions:

1. The Contractor is bound to the standards of quality established in the Contract Documents. Refer to Article 6 of the General Conditions regarding “Equals”.
2. The substitution of materials or equipment shall not be permitted unless the Engineer has given prior approval for the substitution in writing.
3. The Contractor shall certify that the proposed substitution has been determined to be equal or superior to the product specified. The proposed substitution shall be in complete compliance with the provisions in the Contract Documents.

PART 2 - PRODUCTS

2.1 SUBMITTALS

A. General: The Contractor shall comply with Article 6 of the General Conditions regarding “Submittals”.

B. Submissions: Submittals will be stamped by the Engineer in one of the following ways:

1. “Approved” – No exceptions are taken, subject to compliance with the Contract Documents.
2. “Approved as Corrected” – Minor corrections are noted and a resubmittal is not required, subject to compliance with the corrections and the Contract Documents.
3. “Not Approved” – The submittal material, method or system is totally rejected and does not meet the intent of the Specifications.
4. “Revise and Resubmit” – Revise prior to resubmittal is required.

C. Submission Procedure: The Contractor shall provide a minimum of 6 copies of each submittal to the Engineer for review. The Engineer will retain 1 copy, the Inspector receives 1 copy, the Owner receives 2 copies, and the Contractor receives the remaining copies.

2.2 SHOP DRAWINGS

A. Scale and Measurements: Shop drawings shall be to a scale sufficiently large to show all pertinent aspects of the item.

B. Review Comments: The Engineer will show all review comments on each copy of the submittal to be distributed as stated in Article 6 of the general conditions.

2.3 MANUFACTURER'S LITERATURE

A. General: The Contractor shall provide all manufacturers' data pertinent to the submittal, clearly showing which portions of the contents are being provided for review.

PART 3 - EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

A. Numbering: All submittals shall be consecutively numbered. Resubmittals shall cite the original submittal number for reference.

B. Transmittal: Each submittal shall be accompanied by a transmittal letter showing all the information required for identification and checking, including the appropriate Specification sections.

C. Submittal Log: The Contractor shall maintain a submittal log for the duration of the Work that indicates current status of all submittals. The submittal log shall be available to the Engineer at all times for the Engineer's review.

3.2 ENGINEER'S REVIEW

A. General: Review by the Engineer does not relieve the Contractor from responsibility for errors that may result from the submitted data.

B. Revisions: All revisions requested by the Engineer will be required. If the Contractor is considering any required revision to be changed, he shall notify the Engineer as provided in the General Conditions.

END OF SECTION 01330

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Site Prep & Seeding
2. Excavation and backfilling for utility installation.

1.3 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

1. Initial Backfill: Backfill placed above bedding beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

C. Excavation: Removal of material encountered above subgrade elevations.

1. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

D. Fill: Soil materials used to raise existing grades.

E. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. for bulk excavation or 3/4 cu. yd. for trenches that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted. No additional compensation will be paid for rock excavation.

F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

G. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

H. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill.
3. Field quality control testing for earthwork compaction.

B. Blasting plan – Not Permitted.

1.5 QUALITY ASSURANCE

A. Comply with applicable requirements of NFPA 495, "Explosive Materials Code."

B. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials testing, as documented according to ASTM D 3740 and ASTM E 548. The testing agency shall be approved by the Engineer prior to providing services.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not damage existing utilities in the work areas.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: If any borrowed material is required for this project, it shall be obtained from offsite at the contractors' expense.

B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, SM, CH, CL, MH, and ML or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, OL, OH, and PT, or a combination of these group symbols.

1. Unsatisfactory soils also include satisfactory soils not maintained within 3 percent of optimum moisture content at time of compaction.

2. If undercutting material is required, the trench subgrade shall be established using VDOT #57 material. No additional payment will be provided for undercut excavation, removal of undercut, or backfill of trench to subgrade.

D. Backfill and Fill: Satisfactory soil materials.

E. Subbase: VDOT Standard 21-B aggregate. Refer to Virginia Department of Transportation: Road and Bridge Specifications, latest edition; for aggregate mix specifications.

F. Trench Bedding: VDOT #57 aggregate in rock conditions and initial trench backfill in soil conditions.

G. Initial Trench Backfill: Satisfactory soil materials free of rocks or gravel larger than 1-inch

H. Final Trench Backfill: Satisfactory soil materials

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities/casings, minimum 2 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep and water services for tracing; colored as follows:

Blue: Potable Water Systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect existing structures, utilities, fills, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. 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.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

A. Explosives: Not permitted.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials and obstructions.

B. Undercut Excavation: Excavation below subgrade elevation required to support bedding, piping, structures and backfill with VDOT #57 material. Excavate as necessary at no additional cost to the owner. Dispose of material offsite at location determined by the Contractor.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections. Do not disturb bottom of excavations intended for bearing surface.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Unclassified Excavation: Excavation to trench subgrade regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

C. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.

D. Trench Bottom in Rock: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped bedding material.
2. Excavate trenches 6 inches deeper than pipe invert elevation required to allow for bedding material.

E. Trench Bottoms in Native Soil Material: Excavate trenches 4 inches deeper than bottom of pipe invert elevation to allow for initial backfill material. Hand excavate for bell of pipe.

F. Trench Protection: Furnish and install such sheathing, bracing, shoring and furnish necessary signs, barricades and temporary lighting as may be pertinent for the protection of the work, employees, the public, and to guard against contingencies which might give rise to delays in the work. Sheathing left in place shall be at the Contractor’s expense. Where trench wall sloping is necessary for safety or other reasons, the Engineer shall be notified to determine if additional strength pipe will be required. Responsibility for preservation of trench banks and other excavated spaces and the prevention of injury to any persons or property shall rest entirely with the Contractor. Trench construction and safety shall be governed by the Virginia Occupational Safety and Health Standards for the Construction Industry, 29 CFR 1926-Subpart P.

G. Open Trenches: No trench shall remain open overnight.

3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavations under pavement, structures, or utility pipe as directed by Engineer. Lean concrete fill may be used when approved by the Engineer.

3.8 UTILITY TRENCH BACKFILL

A. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. Place and compact bedding course on all trench bottoms. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Bedding depths are shown on the drawings.

C. Hand place and compact initial backfill of subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.

1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

D. Fill voids with approved initial backfill materials while shoring and bracing, and as sheeting is removed.

E. Place and compact final backfill of satisfactory soil material to final grade. Place backfill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment.

F. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under pavement and concrete, road shoulders, backfill trench with stone, scarify and compact each layer of backfill at 95 percent.
2. Under lawn compact each layer of backfill at 85 percent.
3. Back fill which cannot be compacted to requirements will be disposed of by the contractor, backfill trench with suitable material. Dispose and import backfill at no additional cost to the owner.
4. Under gravel areas compact each layer of backfill at 95 percent.

G. Coordinate backfilling with utilities testing.

H. Install detectable warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.9 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

B. All moisture control (aeration or watering) of material excavated for use as fill or backfill will be performed by the Contractor at no additional cost to the Owner.

3.10 COMPACTION OF BACKFILLS AND FILLS

A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under pavements and structures, compact backfill and fill material at 95 percent of the maximum dry density. In addition, the uppermost 6 inches of the road subgrade shall be compacted to 100 percent of the maximum dry density at a moisture content greater than optimum.
2. Compact backfill and fill material in lawn areas at 85 percent of the maximum dry density.

3.11 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from structures as shown on the drawings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn, Pasture, or Unpaved Areas: Plus or minus 1 inch (25 mm).
2. Structures: Plus or minus 1/2 inch (25 mm).
3. Pavements and Graveled Drives: Plus or minus 1/2 inch (13 mm).

3.12 SUBBASE COURSE

A. Under pavements, place subbase course on prepared subgrade according to VDOT Specifications Section 315.

3.13 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified licensed independent geotechnical engineering testing agency to perform field quality control testing. The Engineer will approve or disapprove of the selected agency. If the agency is disapproved, the Contractor must select another agency until approved by the Engineer.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work complies with requirements.

C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies (unless more frequent testing is required by VDOT within the VDOT ROW):

1. Pavement Areas: At subgrade and at each compacted fill and backfill layer, at least two tests for every 5,000 sq. ft. or less of paved area, with a minimum of two tests per lift.

2. Graded Structural Pad Areas: At subgrade and at each compacted fill and backfill layer, one test for every 200 sq. ft. or less of graded pad area. The Owner may require, at his discretion, less frequent testing.
3. Trench Backfill: At each compacted initial and final backfill layer.
   a. Within VDOT right-of-way: Provide at least one test for each 300 feet or less of trench length, but no fewer than two tests for water main installed between the edge of pavement and the ditchline (unless more stringent testing is required by VDOT). Provide at least one test for each 500 feet or less of trench length, but no fewer than two tests for water main installed outside of the ditchline (unless more stringent testing is required by VDOT).
   b. Within easements and non-VDOT property: Provide at least one test for each 500 feet or less of trench length, but no fewer than two tests.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.14 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.15 SEEDING

A. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash debris, stones larger than 1-1/2 inches in any dimension, and other objects that may interfere with planting or maintenance operations.

B. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.

C. Sow seed at the rate shown on the drawings.

D. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations. Spread uniformly at a minimum rate of 2 tons per acre to form a continuous blanket 1-1/2 inches loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

E. Soil Amendments: Provide soil amendments in not less than the following quantities:

1. 2000 lbs. straw mulch/acre
2. 1000 lbs. 5-10-10 fertilizer/acre
3. 2 tons agricultural limestone/acre

F. Use a seed mix suitable for residential lawns.

G. Use the seed mix schedule shown in the latest version of the Virginia Erosion and Sediment Control Handbook (VESCH), Site Specific Seeding mixture for Permanent Seeding for the following region:
1. Piedmont Area

3.16 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. The Contractor will dispose of all extra soil, unsuitable material and landfill materials such as posts, wire, trash, garbage, etc., off of the ROW and off of the Owner's property.

END OF SECTION 02300

SECTION 02510 - WATER DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.

B. Appendix B of the Contract Documents includes the Town of Altavista Water Specifications. Contractor will comply with the Town of Altavista Water Specifications if specifications are not specifically noted in these plans and specifications.

1.2 SUMMARY

A. This Section includes the following:
1. Piping and specialties for potable water system.
2. PRV Vault : Precast Concrete Manhole

1.3 DEFINITIONS

A. The following are industry abbreviations for materials:

1. DI: Ductile Iron
2. HDPE: High Density Polyethylene
3. PE: Polyethylene
4. PVC: Polyvinylchloride

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Maximum Working Pressures: The following are maximum pressure requirements not including surges pressure for piping and specialties, unless otherwise indicated:

1. Combined Potable-Water and Fire-Protection Water Service: **200 psig.**

1.5 SUBMITTALS

A. Product Data: For the following:

1. Pipe and fittings.
2. Mechanical Pipe restraint systems.
3. Fire Hydrants
4. Valves and valve boxes.
5. Tapping Sleeves.
6. Meters.
7. Casing pipe.

B. Record Drawings: At Project closeout of installed water-service piping according to Section "Summary of the Work."

C. Test Reports: As specified in "Field Quality Control" Article in Part 3.

D. Purging and Disinfecting Reports: As specified in "Cleaning" Article in Part 3.

1.6 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of water-service piping specialties and are based on specific types and models indicated. Other manufacturers' products with equal performance characteristics may be considered unless noted otherwise in these specifications. Refer to Section "Submittal Procedures."

B. Comply with requirements of utility supplying water.

C. Comply with standards of authorities having jurisdiction for potable water-service piping. Include materials, installation, testing, and disinfection.

D. Comply with NSF 61, "Drinking Water System Components--Health Effects," for materials for potable water.

E. Provide listing/approval stamp, label, or other marking on piping and specialties made to specify standards.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

B. During Storage: Use precautions for valves, including fire hydrants, according to the following:

1. Do not remove end protectors, unless necessary for inspection, then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Handling: Use sling to handle valves and fire hydrants whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use hand-wheels or stems as lifting or rigging points.

D. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

E. Protect stored piping from moisture and dirt and elevate above grade.

F. Protect flanges, fittings, and specialties from moisture and dirt.

G. Contractor will purchase and deliver the meters to the Owner.

1.8 PROJECT CONDITIONS

A. Perform site survey, research public utility records, and verify existing utility locations. Contact Town of Hurt and Town of Altavista Utility Departments prior to construction.

B. Verify that water-service piping is installed in compliance with original design and referenced standards.

1.9 SEQUENCING AND SCHEDULING

A. Coordinate connections to water mains with Altavista Water Treatment Plant staff and Town of Hurt Utility Staff.

B. Coordinate with other utilities located within the Work Area.

PART 2 - PRODUCTS

2.1 PIPES AND TUBES

A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.

B. Ductile Iron Pipe: DIP Ductile Iron Pipe: Ductile iron pipe (DIP) and fittings 3” and larger and shall meet or exceed the following requirements:
1. Pipe and fittings shall be the diameter shown on the plans.
2. Pipe and joints shall be manufactured in accordance with ANSI/AWWA C 151/A21.51.
3. All pipe shall be cement-mortar lined in accordance with ANSI/AWWA C 104/A21.4.
4. Pipe shall be rated for a minimum working pressure of **300 psi.**

2.2 PIPE AND TUBE FITTINGS

A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.

B. Ductile-Iron, Mechanical Joint Fittings: AWWA C153 pressure ratings shall be a minimum of **350 psi** for fittings 12 inch and smaller and at least 250 psi for fittings 14 inch and larger. Include cement-mortar lining according to C104 and seal coat according to AWWA C104.
1. Restrained Joint Fittings: Restrained joint fittings shall be utilized on all pressure pipe fittings beneath slab and on all buried pressure water pipe joints. Restrained joints shall use mechanical joint pipe with a mechanical retainer gland. Dimensions of the glands shall be such that they can be used with the standardized mechanical joint bell and tee head bolts conforming to the requirements of AWWA C 111 and AWWA C 153. Restraining glands shall be as listed in the ACSA Approved Products list or approved equal.
2. Restrained Flange Adapters: Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10. Restraint for the flange adapter shall consist of individual actuated gripping wedges with torque limiting actuating screws to insure proper initial set. The flange adapter shall be rated for a working pressure of 350 psi. Flange adapter shall be EBAA Series 2100 MegaFlange, or approved equal.
3. Mechanical to Push-On Joint Connection: An appropriate adapter shall be used to convert from mechanical joint pipe to push-on joint pipe. Adapters shall be by Griffin or approved equal.

4. Push On Joint Pipe: If push-on joint pipe is used, restraining mechanisms shall be a contoured wedge-action retainer gland installed on the spigot (plain) end of the pipe, connected to a standard Fittings in paragraph below are only made in 4- to 8-inch NPS (DN100 to DN200). Use ductile-iron fittings for larger sizes.

C. Flanged Joint, Ductile Iron Pipe: AWWA C151 with flanged ends:

1. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face, unless otherwise indicated.

a. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Ductile-Iron, Flanged fittings shall be 125 pound fittings meeting ANSI/ASME B 16.42, or meeting ANSI/ASME B 16.1 for fittings not available in ductile iron.

E. Steel Casing: Steel casing pipe shall conform to ASTM A-139, Grade B, have a minimum wall thickness of 0.500” for road crossings and a bituminous exterior coating.

1. End Seals: Neoprene rubber, pull-on seals with minimum ½” stainless steel banding with worm gear screw.

2.3 JOINING MATERIALS

A. Ductile-Iron Piping: The following materials apply:

1. Mechanical Joints: AWWA C111 mechanical joint retainer glands, high-strength steel bolts and nuts, and rubber gaskets. Mechanical joints will be used within casings.

2.4 VALVES

A. Non-rising Stem, Resilient-Seated Gate Valves: AWWA C515, ductile-iron body and bonnet; with bronze or ductile-iron gate, resilient seats, bronze non-rising stem, and stem nut. Valve shall have O-ring seals and open counter-clockwise, ends shall be compatible with piping systems in which valves are installed. Valves shall be for at least 250 psi working pressure. Include interior coating according to AWWA C550, and mechanical-joint ends for buried installations and flanged in vaults and interior applications. Gate valves will be American Flow Control 2500 series, Mueller, Kennedy or approved equal gate valve with stainless steel stem.

B. Valve Boxes: Adjustable Cast-iron box of three-piece type, consisting of lid, two piece sliding extension, and base. Lettering "WATER" shall be embossed on the valve box lid in letters not less than 1 inch high. Base shall be proper type and size for the valve with which it was used. Barrel approximately 5 inches (125 mm) in diameter or larger as required to properly access valve stem, and adjustable cast-iron extension of length required for depth of bury of valve.

C. Tapping Sleeve and Tapping Valve: Complete assembly, including tapping sleeve, tapping valve, and bolts and nuts and will be manufactured by American Flow Control, Mueller, or approved equal. Use sleeve and valve compatible with tapping machine.

1. Tapping Sleeve: Grey cast iron (ASTM A126, Grade B) or ductile iron (ASTM A536, Grade 65-45-12), 2-piece bolted sleeve with flanged outlet for new branch connection. Sleeve may have mechanical-joint ends with rubber O-ring gaskets for sealing the side flanges. Include sleeve matching size and type of pipe material being tapped and of outlet flange required for branch connection.

D. Air Release Valve: The air release valve shall be of the float operated, simple lever or compound lever design, and capable of automatically releasing accumulated air from a fluid system while the system is pressurized and operating. The air release valve shall be a combination valve featuring both air release

and air vacuum abilities unless otherwise specified. An adjustable designed orifice button shall be used to seal the valve discharge port with drip-tight shut-off. The orifice diameter must be sized for use within a given operating pressure range to insure maximum air venting capacity. The float shall be of all stainless steel construction and guaranteed to withstand the designed system surge pressure without failure. Valve may be one of the following:

1. The body and the cover shall be cast iron or the valve internal parts shall be stainless steel and the Viton Buna-N® for water tight shut-off, Cla-Val Series 36 or approved equal.
2. The body and cover shall be made of high-strength composite materials, A.R.I D-040 or approved equal.

E. Pressure Reducing Valve: Will be ***CLA-VAL Model # 90-01*** or ***an Approved Equal***. Must provide accurate pressure control, range of adjustment, quick acting solenoid shut-off. Valve shall consist of the CLA-VAL Hytrol main valve and a reducing control.

Valve Options shall include:

1. 300lb. Pressure Class Rating
2. Flanged
3. Cast Steel Material
4. Globe Pattern
5. X101AR Valve Position Indicator w/ Air Release
6. (1) X141 Pressure Gauge
7. Stainless Stell Pilot
8. Pilot System Adjustment range from 30 to 300 psi

2.5 MAG METER

A. Mag Meter: Meter shall be ***Octave Ultrasonic***, or ***an Approved Equal***, suitable for installation with less than 2 pipe diameters upstream straight pipe length and immediate downstream bend connection. The magnetic flow meter shall be of the low frequency electromagnetic induction type and shall produce a DC pulsed signal directly proportional and linear to the liquid flow rate. The meter shall be design for operation on 120 vac +/- 10 percent, 60 Hz +/- 5 percent with a power consumption of less than 15 watts for sizes through 12 inch. The meter shall measure both forward and reverse flow. Complete zero stability shall be an inherent characteristic of the meter system to eliminate the need to adjust the system with a full pipe at zero flow.

B. The metering tubes shall be constructed of stainless steel. All magnetic flow meters shall be designed to mount directly in the pipe between ANSI Class 150 flanges. Meter shall have PE liner and be supplied with tungsten carbide electrodes in a zirconium holder. The meter housing shall be splash-proof and weather resistant design. The exterior of the meter shall be protected by an epoxy paint.

C. The electronics portion of the magnetic flow meter shall include both a magnet driver to power the magnet coils and a signal converter. The signal converter shall be remote mounted and shall be housed in a die cast aluminum case. The interconnecting cable shall be supplied with the meter. The converter shall include a separate customer connection section to isolate the electronics compartment and protect the electronics from the environment. A separate terminal strip for power connection shall be supplied. The electronics shall be of the solid state, feedback type and utilize integrated circuitry. The input span of the signal converter shall be continuously adjustable between 0-1 and 0-31 fps for both analog and frequency outputs and range adjustment shall be direct reading. The converter shall not be affected by quadrature noise nor shall it require zero adjustment or special tools for startup. Input and output signals shall be fully isolated. The converter shall include 4 to 20 mA DC flow rate output as well as totalized flow pulse relay output and additional relay contact programmable for activation above when flow rate is measured above a setpoint.

2.6 CHECK ASSEMBLY

A. 6” Double Check Assembly will be Watts Series LF709 or approved equal. Assembly will not include valves or a strainer. Install butterfly valve upstream of assembly and gate valve downstream of assembly as noted in the details.

B. 2” Double Check Assembly will be Watts Series 007 with freeze sensor or approved equal. Assembly will include two attached valves but will not include a strainer. Contractor shall include suitable SCADA components for the freeze sensor.

2.7 FIRE HYDRANTS

A. Fire hydrants shall be installed on 6 inches or larger lines only. Fire hydrant lead from the main will be DIP.

B. All hydrants shall have removable interiors capable of replacement without digging up the hydrant and be packable under pressure. Threaded joints or spindles shall be bronze and upper and lower barrels shall be of equal diameter. Upper barrel shall be of sufficient length to permit setting hydrant with barrel flange not more than 4 inches (100 mm) above finished grade. All fire hydrants shall have 6 inch (150 mm) bottom connection. Pressure Rating: 250 psi (1725 kPa). Hydrant valve shall open by turning operating nut to left or counterclockwise. Coordinate exterior finish shall with *Town of Hurt Utility Department*. Default exterior finish color shall be red alkyd-gloss enamel paint. Outlet threads shall meet NFPA 1963, with external hose thread used by local fire department. Include cast iron caps with steel chains and Pentagon, 1-1/2 inch (38 mm) point to flat operating and cap nuts.

C. Dry-Barrel Fire Hydrants:
1. AWWA C502, freestanding, one NPS 4-1/2 (DN 115) and two NPS 2-1/2 (DN 65) outlets, 5-1/4 inch (133 mm) main valve, drain valve, and NPS 6 (DN 150) mechanical-joint inlet; nipples will be bronze or non-corrosive metals with “National Standard” threads; interior coating according to AWWA C550; cast iron body, compression-type valve opening against pressure and closing.
2. Hydrant will be safety flange, breakaway type so designed that if broken off, the hydrant will remain closed.
3. Hydrants shall be Mueller Super Centurion 240-A423 or approved equal.

2.8 ANCHORAGES

A. Clamps, Straps, and Washers: ASTM A 506, steel.

B. Rods: ASTM A 575, steel.

C. Rod Couplings: ASTM A 197, malleable iron.

D. Bolts: ASTM A 307, steel.

E. Cast-Iron Washers: ASTM A 126, gray iron.

F. Concrete Reaction Backing: Portland cement concrete mix, 3000 psig (20.7 MPa).

1. Cement: ASTM C 150, Type I.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C33, crushed gravel.
4. Water: Potable.
5. Sizes and Locations: See Drawings

G. In lieu of concrete anchorages, Contractor may install Grip Rings on 12" and smaller diameter lines as manufactured by ***Romac Industries***, or ***an Approved Equal***, and ***Mega-lug***, or ***an Approved Equal,*** restraints for larger pipe.

H. Contractor may utilize restrained joint pipe in lieu of or to supplement other anchorage systems. No additional payment will be made by the Owner for use of restrained joint pipe or alternative anchorage systems. Contractor will provide documentation from manufacturer of adequacy of restrained joint pipe or alternative anchorages.

I. Restrained joint pipe, restrained joints, grip rings, mega-lugs, etc. will utilize a **200 psig** pressure (unless otherwise noted on the Contract Documents or approved by the Engineer in reduced pressure areas) with a **factor of safety of 1.5 to 1** for design of joint restraints. Main-line valves will be treated as dead-ends regarding restraint design.
   1. Joint restraint lengths may be reduced due to reduced static and pump pressures in limited locations as coordinated with the Owner and Engineer.

2.9 PRV VAULT - PRECAST CONCRETE MANHOLE

A. General: Concrete manholes shall be of precast construction. Items delivered and installed at the site shall be structurally sound and free from cracks or major surface blemishes. Manholes not complying with this or these Standards as determined by the Owner's Representative will not be accepted/approved.

B. Construction:
   1. Precast manholes shall conform to ASTM C 478 and the Standard Details.
   2. The eccentric design manhole shall be used, except as otherwise approved and shown on the plans.

C. Frames and Covers: Frames and covers shall be of cast iron conforming to ASTM A 48 for Class 30 Gray Iron. Castings shall be of uniform quality, free from sand holes, gas holes, shrinkage, cracks, and other surface defects. Castings shall be ground smooth and well cleaned by shot blasting. For traffic service castings, bearing surfaces between cover and frame shall be cast or machined with such precision to prevent rocking. Bolt holes for watertight frames and covers shall be cast into the unit at the time of manufacturing to insure proper alignment of holes between frame and cover no matter how the cover is oriented on the frame.

   1. Standard frame and cover opening shall provide a ***36" clear opening***

D. Height control rings may be used to adjust manhole tops to proper grade, however, a maximum of 12 inches total height of control rings will be permitted.

E. Joints: Joints shall be sealed with two rings of butyl rubber rope or O-ring conforming to AASHTO M 198, Type B.

F. All openings for pipe protrusions will be smooth cored or factory cast-in-place. Contractor will seal all openings to minimize groundwater into the vault. Vault will be monitored through warranty period and shall be re-sealed if groundwater is entering into the vault.

2.10 MISCELLANEOUS DEVICES

A. Corporation Stop: Shall have with inlet threads conforming to ANSI/AWWA C 800, commonly known as the "Mueller" thread, and an outlet compatible with the service pipe. Size shall be determined based on the application and approved by the Owner.

B. Sampling Taps: The sampling tap shall be plain end spigot facet, renewable seats, tee handles, polished chrome plated.

C. Tapping Saddle: Saddles will be a double strap, Ford FC202 or approved equal.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Division 2 Section "Earthwork" for excavation, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. Take all precautions necessary to ensure that pipe, valves, fittings, and other accessories are not damaged in unloading, handling, and placing in trench. Examine each piece of material just prior to installation to determine that no damage has occurred. Remove any damaged material from the site and replace with undamaged material.

B. Exercise care to keep foreign material and dirt from entering pipe during storage, handling, and placing in trench. Close ends of in-place pipe at the end of any work period to preclude the entry of animals and foreign material.

C. Bed pipe as specified in Section "Earthwork" or as shown on the drawings.

D. Do not lay pipe when trench bottom is muddy or frozen, or has standing water.

E. Use only those tools specifically intended for cutting the size and material and type pipe involved. Make cut such as to prevent damage to pipe or lining and to leave a smooth end at right angles to the axis of the pipe.

3.3 VALVE APPLICATIONS

A. Install gate valves unless otherwise noted.

B. Install concrete donut around all valves within grass or gravel areas. Donut not required when asphalt or concrete pavement is flush with valve box frame and cover.

C. Install valves below grade with operator nut. Install valves within structures or vaults with handwheel, or lever operators.

3.4 JOINT CONSTRUCTION

A. Ductile-Iron Piping, Gasketed Joints: According to AWWA C600.

1. Permissible deflection in push-on joint pipe shall not be greater than 2/3 of that listed in AWWA C600.

B. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, unless the Engineer approves deviations to layout.

B. Install piping at indicated depth. Where grades on the pressure line conflict with existing pipes or structures, lay pressure line to additional depth with a uniform vertical curve to provide proper clearance without the use of fittings. No additional payment to the contractor will be allowed for additional excavation. Provide allowance for expansion as directed by Engineer.
   1. Typical waterline cover will be 36” with the contractor minimizing highs and low points on the waterline. Only under extraordinary circumstances and with special permission of the Owner shall water lines be deeper than 60 inches, or less than 36-inches deep.
   2. Any deviation in excess of 12” depth variation at the high point of the pressurized system downstream of the booster station requires the written acceptance of the Engineer prior to construction.

C. Install components with pressure rating equal to or greater than system operating pressure.

3.6 INSTALLATION OF PIPE AND FITTINGS

A. General: No valve, hydrant, or other appurtenance on existing water lines shall be opened or closed for any purpose by the CONTRACTOR. Any opening or closing of valves, hydrants, whatsoever shall be by the OWNER of the utilities only.

B. Handling: Pipe shall be placed in the trench in such a manner as to prevent damage to pipe and protective coatings and linings. Under no circumstances shall pipe be dropped or dumped into the trench. As the temperature approaches or drops below freezing, extra care shall be used in handling pipe.

C. Cleaning: Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. Spigot and bell ends of pipe and gaskets shall be cleaned and lubricated according to manufacturer's instructions. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug.

D. Cutting: Pipe shall be cut in a neat and workmanlike manner without damage to the pipe. Unless otherwise authorized by the ENGINEER, cutting shall be done by means of approved type of mechanical cutters. Wheel cutters shall be used when practicable.

E. Direction of Laying: All pipe shall be laid with bell ends facing in the direction of laying unless otherwise directed by the ENGINEER. Where pipe is laid on a grade of 10 percent or greater, or for gravity pipe systems, the laying shall start at bottom and shall proceed upward with the bell ends of pipe upgrade. Each piece of pipe shall be laid true to line and grade. The bottom of the trench shall be smoothly graded and bell holes provided so that the trench bottom provides uniform support to the barrel of the pipe when in final position. Adjustments to line or grade shall be made by removing or adding granular material under the barrel. In no case shall wedges or blocks be used under the body of the pipe. The pipe shall be pushed fully "home" by hand, with a bar and block of wood to cushion the bell, or other methods for large diameter pipe.

F. Bedding: Bedding of pipe shall be placed to the depth shown on the plans or standard details and shall be compacted to specified density. Bedding of ductile iron and PVC pressure pipe will not be required except when used as gravity sewer, in rock excavation, or as shown on the plans.

G. Deflection at Joints: Maximum deflection for force main and pressure pipe joints will be as follows:

Allowable Deflection (in inches)

Pipe Size	Ductile Iron (Push on) Lengths				Ductile Iron (Mechanical) Lengths				PVC-AWWA (Push-on)
	12'	16'	18'	20'	12'	16'	18'	20'	
4"	12	17	19	21	21	28	31	34	12
6"	12	17	19	21	18	24	27	30	4
8"	12	17	19	21	13	18	20	22	3
10"	12	17	19	21	13	18	20	22	2.5
12"	12	17	19	21	13	18	20	22	2
16"	7.5	10	11	12	9	12	13.5	15	-

Flexible pipe may be curved in the trench to the limits specified in "Allowable Deflection (in inches table above)". Do not deflect PVC pipes in joints. Joints must be secured laterally in ditch and deflection effected in the barrel of the pipe unless specific allowance by manufacturer is provided in the joint.

H. Installation of Fittings: Fittings shall be installed with the same care that mainline pipe is installed. Caps or plugs shall be braced to prevent blow off during testing.
1. Ductile iron fittings used on Force main and Other Pressure Pipe shall be supported in accordance with PART 2 PRODUCTS of this Section.

I. Jointing:
1. Mechanical Joints: When installing mechanical joint (MJ) ductile iron pipe, the socket, spigot end and rubber gasket shall be thoroughly washed with soapy water to remove any grease or grit that might damage the gasket. In making up the joint, the gland for MJ pipe followed by the gasket, shall be placed over the plain end of the pipe and inserted into the socket. The gasket shall be pushed into position without excessive force and evenly seated in the socket of the pipe bell, and the gland for MJ pipe, then moved into position against the face of the rubber gasket.
2. Flanged Joints: Where flanged joints are used, they shall be installed by skilled workmen in accordance with the best standard practice. Bolts shall be tightened so as to evenly distribute the joint stress and insure proper pipe alignment.

J. Setting of Valves: Valves shall be installed in accordance with manufacturer's instructions. A valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished grade or as directed by the Owner's Representative. Valves boxes shall be installed in accordance with the Standard Detail.

K. Anchorage: Pressure pipe lines shall be protected against joint pulling or thrust damage by suitable concrete anchors, braces, tie rods or mechanical joint restraining devices installed at direction changes as a result of fittings and all other critical points.

L. Rods and clamps shall be galvanized or otherwise rust proof treated.

M. Installation of Pipe Supports: Exposed piping inside of building and vaults shall be supported both horizontally and vertically such that forces are transmitted to the supports and sagging is eliminated.

3.7 PIPING INSTALLATION

A. Water-Main Connection: Remove existing fittings and connect to existing water mains with size and in location as indicated on the Drawings.

B. Install ductile-iron piping according to AWWA C600.

C. At all dead end lines install a valve and cap. Restrain cap using rods and clamps as approved by the Engineer.

D. Bury piping with depth of cover over top at least 36 inches and no more than 42 inches unless otherwise coordinated and approved by Owner or Engineer.

E. Contractor may install tee/reducer combination in lieu of saddle tap for dry connections to smaller diameter pipe.

3.8 ANCHORAGE INSTALLATION

A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Gasketed-Joint, Ductile-Iron, Potable-Water Piping: According to AWWA C600.

B. Apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of installed ferrous anchorage devices.

C. Provide manufacturer fabrication drawings sealed by a licensed engineer if restrained joint pipe is used in lieu of external anchorage. Main-line valves are to be treated as dead-ends regarding restrained joint pipe calculations.

3.9 VALVE INSTALLATION

A. General Application: Install valves in accordance with manufacturer's recommendations, AWWA C600, or applicable standards. Use mechanical-joint-end valves for 3-inch and larger for underground installations.

3.10 MAG METER INSTALLATION

A. General Application: Install mag-meter per manufacturer's recommendations.

1. Ensure mag-meter is installed within manufacturer tolerance for proximity to fittings which would impact meter accuracy.

3.11 FIELD QUALITY CONTROL

A. Notify Altavista Water Treatment Plant Staff & Hurt Utility Staff at least 48 hours in advance of the test date, and perform tests in presence of the Engineer.

B. After the line has been back-filled and at least seven days after the last concrete reaction anchor has been poured, subject the line or any valved section of the line to a hydrostatic pressure test in accordance with AWWA C600, except as modified herein. Fill the system with water at a velocity of approximately 1 ft. per second while necessary measures are taken to eliminate all air. After the system has been filled, raise the pressure by pump to 1.5 times the working pressure or up to the rated pressure of the pipe, whichever is less. Test pressures shall be:

1. Not be less than 1.25 times the working pressure at the highest point along the test section
2. Not exceed thrust restraint pressure
3. Not vary by more than +/- 5 psi
4. Not exceed twice the rated pressure of the valves or hydrants when test includes closed gate valves

5. Shall be at least 250 psig as measured at the high point on the section of line under tests.

Measure pressure at the low point on the system compensating for gage elevation. Maintain this pressure for two hours. If pressure cannot be maintained, determine cause, repair, and repeat the test until successful.

C. A leakage test shall be conducted concurrently with the pressure test in accordance with AWWA C600, except as modified herein. Leakage shall be determined with a calibrated test meter, furnished by the Contractor. Leakage is defined as the quantity of water required to maintain a pressure within 5 psi of the specified test pressure, after air has been expelled and the pipe filled with water. Leakage shall not exceed the volumes listed in AWWA C600. If leakage exceeds that specified, find and repair the leaks and repeat the test until successful.

D. All visible leaks shall be repaired regardless of the amount of leakage.

E. Prepare reports for testing activities.

3.12 PIPELINE TESTING

A. General: Testing of pipe lines and structures shall be at the CONTRACTOR's expense. Any defects or leaks shall be repaired or replaced at the CONTRACTOR's expense. Water for the first test shall be provided by the OWNER. Subsequent water for tests shall be at the CONTRACTOR's expense.

B. Pressure Testing:
1. Test Section: Pressure and leakage testing shall be conducted on each valved section (between adjacent valves) of pressure pipeline. Force mains and other pressure pipe without valves shall be tested in sections not to exceed 5,000 feet.
2. Procedures: Pressurization, air removal, and allowances shall be in accordance with AWWA C600, Section 5 or AWWA C605, Section 7 as appropriate for pipe used. Testing shall begin on the first valved section of line within ten days after its completion. The pressure and leakage tests shall be conducted concurrently for a duration of two hours. Water main testing through fire hydrants shall not be permitted. The valved section of the pipe under consideration shall be slowly filled with water and brought to the specified pressure by means of a pump. Before supplying the specified test pressure, all air shall be expelled from the pipe. Testing shall not begin until at least seven days after the last concrete anchor has been poured on the section of line being tested (if high early concrete is used, two days). The ENGINEER or Resident Project Representative shall observe all leakage tests. If the pipe fails to meet test requirements, all leaks shall be repaired and defective pipe replaced at the CONTRACTOR's expense. The test shall be repeated until satisfactory results are obtained. The CONTRACTOR shall be charged for all retests at the normal rates for inspection services.
3. Test Pressures: Test pressure shall be **250 psi** as measured at the lowest point in that test section, unless otherwise noted. For test pressures less than 200 psi, CONTRACTOR shall demonstrate that there is no significant pressure (other than static) in the adjacent sections of pipeline to the one being tested.

3.13 CLEANING

A. Disinfect and test water lines in accordance with AWWA Standard C651 and the following:

B. All water lines shall be disinfected prior to being in operation.

C. Prior to disinfection all water lines shall be flushed unless the tablet method of disinfection is used. All valves and hydrants shall be operated during this operation. Flushing velocities should not be less than 2.5 ft./sec.

D. Methods of Chlorine Application

1. Continuous feed method - Potable water shall be introduced into the pipeline at a constant flow rate. Chlorine shall be added at a constant rate of this flow so that the chlorine concentration in the water in the pipe is at least 50 mg/L. The chlorinated water shall remain in the pipeline at least 24 hours, after which, the chlorine concentration in the water shall be at least 10 mg/L. All valves and appurtenances shall be operated while the chlorinated water remains in the pipeline.

2. The velocity of the potable water in the pipeline shall be less than 1 ft./sec. The water shall then remain in contact with the pipe for 24 hours. All valves and appurtenances shall be operated while the chlorinated water is in the pipeline.

E. Final Flushing- After the required retention period, the heavily chlorinated water shall be flushed from the lines using potable water.

F. Testing - After the lines have been flushed at a velocity of no less than 3 fps (in accordance with AWWA 651-14), the water lines shall be tested. Samples shall be collected at 1200 feet intervals throughout the length of pipeline.

1. All chlorine residual determinations shall be made using only those methods approved by the Virginia Department of Health.

2. Water samples for bacteriological analysis must be collected at 1200 feet intervals throughout the length of pipeline and analyzed by a certified laboratory using one of the two options below (in accordance with AWWA 651-14):
   a. Option A: Two samples taken at least 16 hours apart. A minimum of two samples at least 16 hours apart shall be collected from each sampling location.
   b. Option B: Two samples taken at least 15 minutes apart after the pipeline has been disinfected and allowed to sit for a 16 hour rest period.

   The results of these samples must indicate no coliform contamination before the pipeline can be utilized as part of the waterworks. If contamination is indicated, then the disinfection procedures must be repeated.

3. Water samples will be collected from both connection points (or the connection point and termination point) of the main line. Water samples will be collected from each water main branch larger than 2” as well.

G. Maintain a copy of AWWA Standard C-651 on Project site during all disinfecting operations. An additional copy will be available for review in the Altavista Water Treatment Plant Utility Department.

H. Prepare reports for purging and disinfecting activities.

3.14 SEPARATION OF WATER AND SEWER LINES

A. Waterlines shall normally be separated horizontally from sanitary sewer lines, manholes, and septic system drainfields by a distance of 10 feet measured edge-to edge.

B. Under unusual conditions when local conditions prevent a horizontal separation of 10 feet from sewer lines and manholes, the water line may be laid closer provided that the invert of the water main is 18 inches above the top of the sewer; the sewer constructed of AWWA approved and tested water pipe; and

all manholes are of water tight construction tested in place. The sewer pipe shall be pressure tested in place without leakage prior to backfilling.

C. Waterlines crossing sewers shall be laid to provide at least 18 inches vertical separation between that the invert of the water main and the top of the sewer pipe.

D. Under unusual conditions when local conditions prevent an 18-inch vertical separation, the sewer line passing over or under water mains shall be constructed of AWWA approved water pipe. The sewer pipe shall be pressure tested in place without leakage prior to backfilling. Water lines passing under sewers shall in addition have an 18" vertical separation between the bottom of the sewer and the top of the water line; adequate structural support for the sewer to protect both utilities; and the water pipe be centered on the crossing point so the joints are equidistant and as far away as possible from the sewer.

E. The Engineer will review all unusual sewer and waterline crossing conditions. The crossing conditions will be constructed such that the Engineer can approve the condition.

END OF SECTION 02510

SECTION 11215 - WATER BOOSTER PUMP SYSTEM

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Included: Provide all materials, equipment and labor required for installation of the water pumps at the facility.

1.2 REFERENCES

1. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

1.3 SUBMITTALS

1. General: Submittals for all pumps shall include pump characteristic curves showing capacity in gpm, head, efficiency and pumping horsepower. Information shall be submitted with the shop plans as well as contained in the O&M manual. A draft O&M Manual shall be submitted for review prior to or at time of equipment delivery.

1.4 QUALITY ASSURANCE

1. Spare Parts and Lubrication: Supplier shall provide the OWNER with an adequate supply of spare parts and lubricants to last the duration of the 1 year warranty period. Spare parts shall include all bearings, gaskets, etc. recommended by the equipment manufacturer. An adequate supply shall be defined as the quantity, type, and grade recommended by the equipment manufacturer. Any special lubricants that may be required during the equipment break-in period shall also be provided. Supplier shall also provide a spare pressure transducer for use on either the suction or discharge sides of the system.

2. Nameplates: Pumps and motors shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a plate secured to the equipment.

PART 2 PRODUCTS

2.1 VARIABLE SPEED PACKAGED PUMPING SYSTEM

A. Furnish and install a pre-fabricated and tested variable speed packaged pumping system to maintain constant water pressure delivery pressure. The system shall be provided with three pumps for complete redundancy of single pump design flow. System shall be provided with controls, skid space, and preinstalled valves to allow capacity expansion with the installation the three pumps and variable frequency drive. The system shall be designed to operate on 120/208 volt three phase incoming power supply.

B. The packaged pump system shall be a standard product of a single pump manufacturer. The entire pump system including pumps and pump logic controller, shall be designed and built by the same manufacturer.

C. The complete packaged water booster pump system shall be certified and listed by UL (Category QCZJ – Packaged Pumping Systems) for conformance to U.S. and Canadian Standards.

D. Service: Potable Water

Single Pump Design Points: 40 gpm @ 100 feet TDH (Maximum Full RPM Flow)
13 gpm @ 180 feet TDH (Minimum Full RPM Flow)
26 gpm @ 150 feet TDH (Additional Full RPM Condition)

Minimum Shutoff Head: 185 feet TDH

Minimum Motor Horsepower: 2 HP (Non-Overloading Along Full Curve)

NPSHR: Less Than 15' Along Full Curve

Initial Set Points: 100 psi System Discharge Pressure

5 psi Max Disch. Pressure Drop (~50 psi Low Flow Cutout Resume)

F. System shall be Grundfos MPC-E (CRE 5-6), Goulds AquaForce, Fairbanks Nijhuis Intelliboost, or approved equal.

2.2 SEQUENCE OF OPERATION

A. General: The system controller shall operate equal capacity variable speed pumps to maintain a constant discharge pressure (system set-point). The system controller shall receive an analog signal [4-20mA] from the factory installed pressure transducer on the discharge manifold, indicating the actual system pressure. As flow demand increases the pump speed shall be increased to maintain the system set-point pressure. When the operating pump(s) reach 96% of full speed (adjustable), an additional pump will be started and will increase speed until the system set-point is achieved. When the system pressure is equal to the system set-point all pumps in operation shall reach equal operating speeds. As flow demand decreases the pump speed shall be reduced while system set-point pressure is maintained. When all pumps in operation are running at low speed the system controller shall switch off pumps when fewer pumps are able to maintain system demand.

The system controller shall be capable of switching pumps on and off to satisfy system demand without the use of flow switches, motor current monitors or temperature measuring devices.

All pumps in the system shall alternate automatically based on demand, time and fault. If flow demand is continuous (no flow shut-down does not occur), the system controller shall have the capability to alternate the pumps every 24 hours, every 48 hours or once per week. The interval and actual time of the pump change-over shall be field adjustable.

2.3 SYSTEM CONSTRUCTION

A. General: The suction and discharge manifolds shall be constructed of 316 stainless steel. Pump Isolation valves shall be provided on the suction and discharge of each pump. Isolation valve sizes 2 inch and smaller shall be nickel plated brass full port ball valves. The valve disk shall be of stainless steel. The valve seat material shall be EPDM and the body shall be cast iron, coated internally and externally with fusion-bonded epoxy.

A spring-loaded non-slam type check valve shall be installed on the discharge of each pump. The valve shall be a wafer style type fitted between two flanges. The head loss through the check valve shall not

exceed 2 psi at the pump design capacity. Check valves 2" and larger shall have a body material of stainless steel or epoxy coated iron (fusion bonded) with an EPDM or NBR resilient seat. Spring material shall be stainless steel. Disk shall be of stainless steel or leadless bronze.

Pressure transducers shall be factory installed on the suction and discharge manifold. Pressure transducers shall be made of 316 stainless steel. Transducer accuracy shall be +/- 1.0% full scale with hysteresis and repeatability of no greater than 0.1% full scale. The output signal shall be 4-20 mA with a supply voltage range of 9-32 VDC.

A factory installed liquid level sensor shall be installed on the suction manifold for dry-run (water shortage) protection.

A bourdon tube pressure gauge, 2.5 inch diameter, shall be placed on the suction and discharge manifolds. The gauge shall be liquid filled and have copper alloy internal parts in a stainless steel case. Gauge accuracy shall be 2/1/2 %. The gauge shall be capable of a pressure of 30% above its maximum span without requiring recalibration. Suction side gauge shall be compound vacuum/pressure type. Ranges shall be as shown on the plans.

The base frame shall be constructed of corrosion resistant 304 stainless steel. Rubber vibration dampers shall be fitted between each pumps and base frame to minimize vibration.

2.4 PUMPS

A. General: The pumps shall be of the in-line vertical multi-stage design and shall be ANSI/NSF 61 approved for drinking water.

B. Construction: The pump impellers shall be secured directly to the pump shaft by means of a splined shaft arrangement. The suction/discharge base shall have ANSI Class 250 flange or internal pipe thread (NPT). Materials of construction shall be as follows:

1)	Suction/discharge base, pump head, motor stool:	Cast iron (Class 30)
2)	Impellers, diffuser chambers, outer sleeve:	304 Stainless Steel
3)	Shaft	316 Stainless Steel
4)	Impeller wear rings:	304 Stainless Steel
5)	Shaft journals and chamber bearings:	Silicon Carbide
6)	O-rings:	EPDM

C. Seal: The shaft seal shall be a balanced o-ring cartridge type with the following features:

1)	Collar, Drivers, Spring:	316 Stainless Steel
2)	Shaft Sleeve, Gland Plate:	316 Stainless Steel
3)	Stationary Ring:	Silicon Carbide/ Graphite
4)	Rotating Ring:	Silicon Carbide/ Graphite
5)	O-rings:	EPDM

Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, shaft coupling and motor. The entire cartridge shaft seal shall be removable as a one piece

component. Pumps with motors equal to or larger than 15 hp (fifteen horsepower) shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.

2.5 VARIABLE FREQUENCY DRIVES (PANEL MOUNT)

A. General: The VFD shall convert incoming fixed frequency single-phase 120/240 volt AC power into a variable frequency three phase power supply for controlling the speed of three-phase AC induction motors. VFDs shall be mounted within the system control panel. Each VFD shall be a six-pulse input design, and the input voltage rectifier shall employ a full wave diode bridge. The output waveform shall closely approximate a sine wave. The VFD shall be of a PWM output design utilizing current IGBT inverter technology and voltage vector control of the output PWM waveform. The VFD shall include a full-wave diode bridge rectifier and maintain a displacement power factor of near unity regardless of speed and load.

The VFD shall produce an output waveform capable of handling maximum motor cable distances of up to 1,000 ft. (unshielded) without tripping or derating. The VFD shall utilize an output voltage-vector switching algorithm, or equivalent, in both variable and constant torque modes. VFD shall automatically boost power factor at lower speeds.

The VFD shall be able to provide its full rated output current continuously at 110% of rated current for 60 seconds. Switching of the input power to the VFD shall be possible without interlocks or damage to the VFD at a minimum interval of 2 minutes. Switching of power on the output side between the VFD and the motor shall be possible with no limitation or damage to the VFD and shall require no additional interlocks.

The VFD shall have temperature controlled cooling fans for quiet operation, minimized internal losses, and greatly increased fan life. No side clearance shall be required for cooling of the units.

VFD shall provide full torque to the motor given input voltage fluctuations of up to +10% to -15% of the rated input voltage. The VFD shall provide internal DC link reactors to minimize power line harmonics and to provide near unity power factor. VFD's without a DC link reactor shall provide a 5% impedance line side reactor.

VFD to be provided with the following protective features:

1) VFD shall have input surge protection utilizing MOV's, spark gaps, and Zener diodes to withstand surges of 2.3 times line voltage for 1.3 msec.

2) VFD shall include circuitry to detect phase imbalance and phase loss on the input side of the VFD.

3) VFD shall include current sensors on all three-output phases to detect and report phase loss to the motor. The VFD will identify which of the output phases is low or lost.

4) VFD shall auto-derate the output voltage and frequency to the motor in the presence of sustained ambient temperatures higher than the normal operating range, so as not to trip on an inverter temperature fault. The use of this feature shall be user-selectable and a warning will be exported during the event. Function shall reduce switching frequency before reducing motor speed.

5) VFD shall auto-derate the output frequency by limiting the output current before allowing the VFD to trip on overload. Speed can be reduced, but not stopped.

6) The VFD shall have the option of an integral RFI filter. VFD enclosures shall be made of metal to minimize RFI and provide immunity.

VFD to be provided with the following interface features:

1) VFD shall provide an alphanumeric backlit display keypad, which may be remotely mounted using standard 9-pin cable. VFD may be operated with keypad disconnected or removed entirely. Keypad

may be disconnected during normal operation without the need to stop the motor or disconnect power to the VFD.

2) VFD shall display all faults in plain text; VFD's, which can display only fault codes, are not acceptable.

3) All VFD's shall be of the same series, and shall utilize a common control card and LCP (keypad/display unit) throughout the rating range. The control cards and keypads shall be interchangeable through the entire range of drives used on the project.

4) VFD keypad shall be capable of storing drive parameter values in non-volatile RAM uploaded to it from the VFD, and shall be capable of downloading stored values to the VFD to facilitate programming of multiple drives in similar applications, or as a means of backing up the programmed parameters.

5) A red FAULT light, a yellow WARNING light and a green POWER-ON light shall be provided. These indications shall be visible both on the keypad and on the VFD when the keypad is removed.

6) A start guide menu with factory preset typical parameters shall be provided on the VFD to facilitate commissioning.

7) VFD shall provide full galvanic isolation with suitable potential separation from the power sources (control, signal, and power circuitry within the drive) to ensure compliance with PELV requirements and to protect PLC's and other connected equipment from power surges and spikes.

8) All inputs and outputs shall be optically isolated. Isolation boards between the VFD and external control devices shall not be required.

9) There shall be three programmable digital inputs for interfacing with the systems external control and safety interlock circuitry. An additional digital input is preprogrammed for start/stop.

10) The VFD shall have two analog signal inputs. One dedicated for sensor input and one for external set point input.

11) One programmable analog output shall be provided for indication of a drive status.

12) The VFD shall provide two user programmable relays with selectable functions. Two form 'C' 230VAC/2A rated dry contact relay outputs shall be provided.

13) The VFD shall store in memory the last 5 faults with time stamp and recorded data.

14) The VFD shall be equipped with a standard RS-485 serial communications port for communication to the multi-pump controller. The bus communication protocol for the VFD shall be the same as the controller protocol.

VFD service conditions shall be as follows:

1) Ambient temperature operating range, -10 to 45ºC (14 to 113°F).

2) 0 to 95% relative humidity, non-condensing.

3) Elevation to 1000 meters (3,300 feet) without derating.

4) VFD's shall be rated for line voltage of 200 to 240VAC; with +10% to -15% variations. Line frequency variation of ± 2% shall be acceptable.

2.6 PUMP SYSTEM CONTROLLER

1. General: The pump system controller shall be a standard product developed and supported by the pump manufacturer and shall be housed in a pump control panel remotely mounted on the interior station wall as shown on the plans. The controller shall be microprocessor based capable of having software changes and updates via personal computer (notebook). The controller user interface shall have a VGA display with a minimum screen size of 3.5" x 4.5" for easy viewing of system status parameters and for field

programming. The display shall have a back light with contrast adjustment. Password protection of system settings shall be standard. The controller shall provide internal galvanic isolation to all digital and analog inputs as well as all fieldbus connections. The controller shall be pre-programmed with data representing the installed pump curves to allow the system to automatically adapt operation of the pumps to optimize energy efficiency and pump performance while ensuring that pumps operate at safe factory recommended duty conditions.

2. Display: The controller shall display the following as status readings from a single display on the controller (this display shall be the default):

    1) Current value of the control parameter, (typically discharge pressure)
    2) Most recent existing alarm (if any)
    3) System status with current operating mode
    4) Status of each pump with current operating mode and rotational speed as a percentage (%)

3. Inputs and Outputs: The controller shall have as a minimum the following hardware inputs and outputs:

    1) Three analog inputs (4-20mA or 0-10VDC)
    2) Three digital inputs
    3) Two digital outputs
    4) Ethernet connection
    5) Field Service connection to PC for advanced programming and data logging

    The controller shall be capable of receiving a remote analog set-point (4-20mA or 0-10 VDC) as well as a remote system on/off (digital) signal.

4. Programming: Pump system programming (field adjustable) shall include as a minimum the following:

    1) Water shortage protection (analog or digital)
    2) Transducer Settings (Suction and Discharge Analog supply/range)
    3) PI Controller (Proportional gain and Integral time) settings
    4) High system pressure indication and shut-down
    5) Low system pressure indication and shut-down
    6) Low suction pressure/level shutdown (via digital contact)
    7) Low suction pressure/level warning (via analog signal)
    8) Low suction pressure/level shutdown (via analog signal)

    The system controller shall be able to accept up to seven programmable set-points via a digital input, (additional input/output module may be required). The controller shall have advanced water shortage protection. When analog sensors (level or pressure) are used for water shortage protection, there shall be two indication levels. One level is for warning indication only (indication that the water level/pressure is getting lower than expected levels) and the other level is for complete system shut-down (water or level is so low that pump damage can occur). System restart after shut-down shall be manual or automatic (user selectable).

    The system pressure set-point shall be capable of being automatically adjusted by using an external set-point influence. The set-point influence function enables the user to adjust the control parameter (typically

pressure) by measuring an additional parameter. (Example: Lower the system pressure set-point based on a flow measurement to compensate for lower friction losses at lower flow rates).

The pump system controller shall store up to 24 warning and alarms in memory. The time, date and duration of each alarm shall be recorded. A potential-free relay shall be provided for alarm notification to the building management system. The controller shall display the following alarm conditions:

1) High System Pressure
2) Low system pressure
3) Low suction pressure (warning and/or alarm)
4) Individual pump failure
5) VFD trip/failure
6) Loss of sensor signal (4-20 mA)
7) Loss of remote set-point signal (4-20mA)
8) System power loss

5. Control Panel: The pump system controller shall be mounted in a UL NEMA Type 4 rated enclosure. The entire control panel shall be UL 508 listed as an assembly. The control panel shall include a main disconnect, circuit breakers for each pump and the control circuit and control relays for alarm functions. Panel shall include the following:

   1) Pump Run Lights
   2) Pump Alarm Lights
   3) System Fault Light
   4) Audible Alarm
   5) Surge Arrestor
   6) Emergency/Normal Operation Switches
   7) Service Disconnect Switches

6. Controller: The controller shall be capable of receiving a redundant sensor input to function as a backup to the primary sensor (typically discharge pressure). The controller shall have a pump "Test Run" feature such that pumps are switched on during periods of inactivity (system is switched to the "off" position but with electricity supply still connected). The inoperative pumps shall be switched on for a period of two to three (2-3) seconds every 24 hours, 48 hours or once per week (user selectable). The controller shall be capable of displaying instantaneous power consumption (Watts or kilowatts) and cumulative energy consumption (kilowatt-hours). The actual pump performance curves (5^{th} order polynomial) shall be loaded (software) into the pump system controller.

   The controller shall SCADA compatible with Ethernet interface and communication via Modbus or DF1 protocol. Supplier shall provide a full memory address list.

7. Dry Run Protection: System shall include a pressure transducer on the suction supply to detect loss of supply water pressure and halt the pumps. System shall indicate alarm status and be capable of automatically resuming normal operation when adequate supply water is restored.

2.7 LOW FLOW STOP FUNCTION

A. General: The system controller shall be capable of stopping pumps during periods of low-flow or zero-flow without wasting water or adding unwanted heat to the liquid. During low flow periods, the bladder tank capacity shall be utilized to supply the system with pump operation cycling to fill the tank and maintain minimum pressure setting.

When a low flow is detected, the system controller shall increase pump speed until the discharge pressure reaches the stop pressure (system set-point plus 50% of programmed on/off band). The pump shall remain off until the discharge pressure reaches the start pressure (system set-point minus 50% of programmed on/off band). Upon low flow shut-down a pump shall be restarted in one of the following two ways:

1) Low Flow Restart: If the drop in pressure is slow when the start pressure is reached (indicating the flow is still low), the pump shall start and the speed shall again be increased until the stop pressure is reached and the pump shall again be switched off.

2) Normal Flow Restart: If the drop in pressure is fast (indicating the flow is greater than 10% of pump nominal flow) the pump shall start and the speed shall be increased until the system pressure reaches the system set-point.

2.8 PRESSURE TANK

A. General: Pressure tank may be provided by either the Contractor or Booster Pump System Provider. Pressure Tank shall be of the captive air diaphragm or bladder type designed for potable water application and meeting NSF 61 Standards.. Tank shall have a minimum working pressure of 125 psi and 119 gallon capacity with an available drawdown of 25 gallons when operated at 30 to 50 psi. Diaphragm shall be constructed of butyl rubber.

PART 3 EXECUTION

3.1 INSTALLATION

1. General: All specified equipment shall be installed where indicated on the plans and in accordance with the manufacturer’s instructions.

3.2 MANUFACTURER'S RESPONSIBILITIES

1. Factory Testing: The entire pump station shall be factory performance tested as a complete unit prior to shipment. Job-site programming shall be entered into the controller prior to shipment. A verified performance test report shall be made available from the system manufacturer. The system shall undergo a hydrostatic test of 350 psig for a minimum of 15 minutes prior to shipment.

2. Field Service: The services of a factory trained field service technician shall be provided to inspect the completed installation, make all adjustment necessary to place the system in satisfactory operation and instruct the operating personnel in the proper care and operation of the equipment.

3. Manufacturer's Warranty: The manufacturer of the equipment shall warrant it to be of quality construction, free from defects in material and workmanship. The warranty period shall be a non-prorated period of 24 months from date of installation. Components failing to perform as specified by the ENGINEER, or as represented by the manufacturer, or proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts or labor to the OWNER.

END OF SECTION 11215

SECTION 13210 – TANK MIXING AND AERATION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: These specifications provide the requirements to furnish, install and place into operation a spray mixing and aeration system to provide total trihalomethane (TTHM) removal. This plan and specification are based around a floating mixer, submersible pump and roof mounted blower that can be installed without removing the tank from service.

1.2 QUALITY ASSURANCE

A. Guaranteed Performance: The Trihalomethane removal system shall be designed to achieve an approximate 50% reduction of TTHM in the tank, comparing untreated water entering the tank to treated water leaving the tank. Design shall be based on the following tank parameters:

1. 250,000 Gallon steel elevated storage tank
2. 26’ Height of bowl from base of bowl to overflow elevation
3. 45’ Diameter
4. 90,000 Gallon per day (gpd) maximum usage
5. 300 gallon per minute (gpm) maximum fill rate
6. 91 µg/L maximum previously measured TTHM residual on the water main outside the tank

If the system does not meet the design criteria throughout the first year following installation, system supplier shall install additional equipment to provide additional TTHM reduction. System supplier shall be responsible for all labor required for installation of additional equipment. Material cost of new equipment shall be negotiated between Owner and system supplier

B. Continuous Operation Equipment. The spray equipment shall operate continuously, all day and all night, using single phase power source.

C. No Visual Defects. The spray equipment shall have no visual defects, and shall have high quality welds, assembly, and corrosion resistant finish.

D. Qualified US Manufacturer. The manufacturer of the equipment shall have extensive experience in the production of such equipment, and the equipment shall be manufactured in the continental United States.

E. Factory Startup Services. Delivery, installation and startup services shall be included by the system supplier. Services shall be performed by full time factory employees experienced in the operation of this equipment and who have completed OSHA safety trainings applicable to this type of installation.

1.3 SUBMITTALS

A. General: Comply with pertinent provisions of Section 01330 - Submittal Procedures.

B. Content: Submittals shall include the following information:

1. A qualification statement demonstrating compliance with Section 1.03.

2. Shop drawings for the circulation equipment.
3. Manufacturer's literature, illustrations and specification sheets defining materials of construction, dimensions, and weights.
4. Warranty Statement.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND FEATURES

A. General: The total trihalomethane (TTHM) removal system shall consist of an in-tank spray system with mixer and forced air above water injection equipment. System supplier shall provide all associated equipment necessary for a complete and operational system, including all electrical control panels and accessories.

2.2 SPRAY MIXER

A. General: The spray mixer shall be a grid powered circulation and spray aeration system specifically designed for TTHM removal in potable water tanks and reservoirs. Materials of construction shall include 316 stainless steel frame, nozzle pressure transducer, hardware, fittings, stainless steel pump, ANSI 61 approved motor and other NSF approved materials. Unit shall be designed for continuous operation and installation through 18-inch minimum clear roof opening. The spray unit shall be designed for direct flow rate of 90,000 GPD.

B. Stainless Steel Construction: The spray equipment shall be constructed primarily of Type 316 stainless steel metal, pickled or passivated, for strength and superior corrosion resistance. Other non stainless steel materials shall be of NSF approved materials and rated for contact with potable water.

C. Motor: The spray equipment shall be mechanically operated by a motor that meets the following criteria.
1. Direct Drive, with no gearbox and no lubrication maintenance required.
2. Designed for submersible operation or operation in wet environments.
3. Designed for Continuous Operation without overheating or compromising motor life expectancy.
4. Single-phase 240VAC power supply.

D. Horizontal, Low Velocity intake: The THMR spray equipment shall be supplied with an intake capable of being positioned at the lowest elevation of the tank or reservoir floor. The intake level setting shall bring water into the spray at a horizontal layer within 1 inches (2.5 cm) of the tank or reservoir floor. The intake shall include a singular hose of adequate length to reach the required intake depth setting.

E. Nozzles: The spray equipment shall be equipped with a singular spray sized specifically for the pump capacity output. Unit shall be constructed of 316 stainless steel for optimal corrosion resistance and long wear life. The nozzle shall have a downward discharge angle capable of providing ice protection, and prevent long-term erosion effects to tank coatings, spray discharge out overflows, hatches, vents, or other openings. Nozzle shall include an inline rigid filter constructed of 316 stainless steel.

F. Monitoring: The spray equipment shall be compatible with pressure sensing capabilities and include a 316 stainless steel pressure transducer to provide pressure monitoring of the nozzle and filter plugging. The transducer shall output absolute pressure in a 4-20mA signal and include submersible signal cable accessible at the tank roof and a tank penetration fitting compatible with most tanks.

G. Maintenance Requirements: The spray equipment shall operate normally without the requirement for lubrication of any system components including motor. The system shall not include components subject to normal wear and shall not require spare parts to be kept on hand.

2.3 SUPPLEMENTAL SUBMERSIBLE MIXER

A. General: A high-flow mixer shall be provided to provide supplemental mixing to the spray unit as well as auxiliary mixing during non-peak TTHM formation times when the unit may be inactive. The mixer shall be of 316 stainless steel and non-corrosion polymer construction and shall include a 0.75 HP single phase motor. The mixer shall rest on the tank floor with polymer support pads and shall be designed for installation through a minimum 12” diameter roof opening. The unit shall be supplied with a minimum 75' of submersible cable, tank/roof junction box, through tank fitting for the power cord, and connection kit.

2.4 FORCED AIR VENTILATION

A. General: The system shall include a forced air ventilation system for the headspace of the tank to remove TTHMs which have been volatilized by the spray unit.

B. Blower: Ventilation shall be provided by a 2 HP blower capable of delivering 750 cubic feet per minute of air flow. Unit shall be UL listed and include CSA certified single phase TEFC motor with NEMA Class F insulation. Blower shall include 316 stainless steel base and skid frame, adaptable to Unistrut channel.

C. Mounting: Blower skid shall be mounted to tank roof. Tank penetration(s) required for air injection also shall be provided by system installers. A through-plate fitting shall be placed through the roof of the tank for securement of the blower skid. The through plate fitting shall be compatible to connect an interior air duct hose to the interior side of the through plate fitting.

2.5 CONTROL PANELS

A. General: System supplier shall provide electrical control panels for all equipment to provide a complete operational system. These shall include independent or consolidated panels to operate the spray mixer, submersible mixer, and blower. All panels shall operate on 120 volt or 240 volt single phase electrical supply. Dry contact and analog outputs shall be provided for connection to Owners SCADA system to monitor all available run, alarm, and process status conditions.

B. Spray Control Panel: The Intelligent Pump Starter panel shall be industrial grade construction which includes a minimum Nema 3R enclosure, door mounted heavy-duty HOA switch, run light, and lockable safety handle, surge suppressor, NEMA/IEC rated magnetic contactor, and circuit breaker disconnects for branch and short circuit protection. Panel shall also include SmartStart™ Motor Protection with Integrated Tru-power™ electronic motor and pump protection featuring a wide-range, adjustable, class 5-30 electronic overload to provide motor protection from over/under power (dry-run), over/under voltage protection, voltage phase loss, voltage and current unbalance, stalled/locked rotor, cycle fault, and ground fault (UL 1053 certified). Built-in power monitoring and fault logging shall be included for easy troubleshooting to view voltage, current, and power factor. Panel shall include a door mounted LCD digital panel display meter with built in 24VDC power supply to display the monitored nozzle pressure.

C. Mixer Control Panel: Panel shall include minimum Nema 3R enclosure with door mounted heavy-duty HOA switch, overload protection, reset button and pilot light.

D. Blower Control Panel: The Intelligent Motor Starter panel shall be industrial grade construction which includes a minimum Nema 3R enclosure, door mounted heavy-duty HOA switch, run light, and lockable safety handle, surge suppressor, NEMA/IEC rated magnetic contactor, and circuit breaker disconnects for branch and short circuit protection. Panel shall also include SmartStart™ Motor Protection with Integrated Tru-power™ electronic motor and pump protection featuring a wide-range, adjustable, class 5-30 electronic overload to provide motor protection from over/under power (dry-run), over/under voltage protection, voltage phase loss, voltage and current unbalance, stalled/locked rotor, cycle fault, and ground fault (UL 1053 certified). Built-in power monitoring and fault logging shall be included for easy troubleshooting to view voltage, current, and power factor.

E. SCADA Components for Control Panels: Contractor will install SCADA monitoring and control equipment suitable for the following:

1. Sprayer, Mixer and Blower-Monitor and control ON/OFF condition
2. Sprayer, Mixer and Blower - Monitor and remote reset any faults

PART 3 - EXECUTION

3.1 INSTALLATION

A. Maintain Service: Plans and specifications are based around a complete mixing, spray and ventilation system that can be installed in the tank with the tank in service while maintaining water service to the system. Contractor may provide a complete system which may be installed by removing the tank from service while maintaining domestic pressures and fire flow availability to the water system. Contractor will be responsible for all pumps, temporary tanks, piping, connections, metering, disinfection, lost water (blowoff), additional power and any & all other means & methods as may be necessary to maintain pressures and flows to the system while the tank is removed from service. Contractor will be responsible for payment to Owner at the rate of $20/1000 gallons for water lost (blowoff) due to system installation measures.

B. Factory Personnel: The installation and startup shall be performed by full time factory employees trained in the operation of the THMR spray equipment.

C. Tank Roof Penetrations: All tank penetrations required for the system shall be made through the tank roof. No penetrations shall be allowed through the tank sidewall. Anticipated penetrations include air flow connection from the ventilation blower as well as conduits for electrical power and signal monitoring of all in-tank equipment. All roof penetrations shall be made using NPT couplings continuously welded to the roof panels to provide a watertight seal. Protective measures and care shall be taken during cutting of all penetrations to ensure that debris does not fall within the tank.

D. Safety Training: Installation personnel shall have received job-specific safety training on

1. Working over Water
2. Disinfecting Procedures
3. Confined Space Entry
4. Fall Protection

E. Safety Equipment. Installation personnel shall be equipped with job-specific safety equipment to complete the installation of a THMR spray equipment following all OSHA safety regulations. Safety equipment shall include confined space, fall protection, rescue, decontamination, and communication tools such as (air monitor, ventilation fan, tri-pod, winches, FBH's, retractables, ropes, lanyards, descenders, radios, hard hats, step pools, disinfectant sprayer, etc.)

F. Training: The training program shall educate operators, maintenance, engineering, and management personnel with the required levels of system familiarity to provide a common working knowledge concerning all significant aspects of the system being supplied. The training program shall consist of a minimum one 8-hour day. At least two weeks prior to the requested start of the program, the proposed dates of training shall be submitted to the Owner and the Engineer for approval. The supplier shall provide all instructional course material, equipment and manuals to conduct the training program.

3.2 BACTERIOLOGICAL TESTING

A. Bacteriological Testing: Two or more successive samples taken at 24 hour intervals shall be required following system installation and shall indicate bacteriologically satisfactory water. All tests shall be paid for by the CONTRACTOR.

3.3 WARRANTY

A. Warranty: The TTHM reduction system shall be warranted to be free of defects in materials and workmanship for a period of 2 years.

B. Guaranteed Performance: The Trihalomethane removal system shall be designed to achieve an approximate 50% reduction of TTHM in the tank. Performance shall be guaranteed as described in Paragraph 1.2 “Quality Assurance” of this section.

END OF SECTION 13210

16900 – CONTROLS AND INSTRUMENTATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: This section covers work necessary for the design, documentation, assembly, installation, field testing, startup, training, and final documentation for a the mag-meter and control valve systems, as described herein. Major components of this system shall include the specified software, materials, equipment, and installation required to implement a complete and operational system along with any associated panel or field mounted instrumentation.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:

C. Section 01330 – Submittal Procedures

1.2 GENERAL REQUIREMENTS

A. Electrical: All wiring shall be in complete conformance with the National Electric Code, state, local and NEMA electrical standards. All incoming and outgoing wires shall be connected to numbered terminal blocks and all wiring neatly tied and fastened to chassis as required. For ease of servicing and maintenance, all wiring shall be color coded and uniquely numbered. The wire color code and number shall be clearly shown on the drawings, with each wire's color and number indicated.

1.3 QUALITY ASSURANCE

A. General: The Contractor shall be responsible for and shall provide for the design, supply, delivery, installation, certification, calibration and adjustment, software configuration, testing and startup, owner training, warranty and routine future field services, of a complete coordinated system which shall perform the specified functions.

B. Standard Products: In order to achieve standardization for appearance, operation, maintenance, spare parts and manufacturer's service, to the greatest extent practical, like items of equipment provided hereunder shall be the end products of the same manufacturer.

1.4 SUBMITTALS

A. General: Comply with pertinent provisions of Section 01330 - Submittal Procedures.

B. Hardware Submittals: Before any components are fabricated, and/or integrated into assemblies or shipped to the job site, furnish to the Engineer for their review copies of submittal documents. Submittals shall include full details, shop drawings, catalog cuts, and such other descriptive matter and documentation as may be required to fully describe the equipment and to demonstrate its conformity to these specifications. Specifically, the Contractor shall submit the following materials:

1. Block diagram and operational description of the system showing all major components and their interconnections and interrelationships. Label each diagram and specify all external power and communications interfaces. Required documentation sets shall be furnished in bound hardcopy and final documentation shall also be provided in electronic format on CD.

2. Drawings of equipment to be supplied shall include, as a minimum: overall dimension details for each panel, console, etc., including internal and external arrangements and door mounted operator devices with nameplate designations. Wiring diagrams of equipment including field device connections shall be included and specific installation/wiring requirements identified.
3. Provide a detailed Bill of Materials along with descriptive literature identifying component name, manufacturer, model number, and quantity supplied.

1.5 O&M MANUALS

A. Submit Operations & Maintenance Manuals for all supplied equipment and controls in accordance with Section 01330 – Submittal Procedures. Manuals shall be include hard-covered, ring bound, loose-leaf O&M manuals as well as digital copies. In addition to "as-built" system drawings, the manuals shall include internal wiring diagrams and operating and maintenance literature for all components provided under this section.

The submitted literature shall be in sufficient detail to facilitate the operation, removal, installation, programming and configuration, adjustment, calibration, testing, and maintenance of each component and/or instrument.

Operation and Maintenance manuals shall include copies of all PLC programs written to accomplish the functions specified. Programs shall be updated after startup is complete, with the fully commented program(s) licensed to and provided to the Owner on compact disk (CD). Two (2) copies shall be provided.

All software and tools required for configuring and programming RTU's, PLC's, and SCADA software shall be provided and licensed to Owner. All custom programing shall be licensed to Owner for their use.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling: Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer’s written instructions. Protect equipment and controls from dirt and damage.

B. Delivery: Schedule deliveries to minimize long-term storage at the Project site and to prevent overcrowding of construction spaces. Deliver products to Project site in an undamaged condition in Manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

PART 2 - PRODUCTS

2.1 LEVEL SENSORS

A. Division III Transducer: Provide ***Omega Series PX603 pressure transducer and associated meter or an Approved Equal.*** The level of the elevated tank shall be measured by a level transducer/transmitter with a diameter of approx.. 1” and ability to provide a 4-20 mA instrumentation signal. The transducer shall be of the solid state head pressure sensing type mounted using a removable cable suspension mounting kit utilizing all stainless steel hardware. The sealed breather system shall compensate for variations in

barometric pressure and expansion and contraction of air due to temperature changes and altitude as well as prevent fouling from moisture and other corrosive elements.

2.2 INSTRUMENTATION

A. Wireless I/O Interface Transmitter/Receiver Set:
1. Transmitter/Receiver shall use a wireless conduit for sending a 4-20 mA signals between the wetwell and the control valve at the WTP. Range shall be 600-1000 feet interior, no line-of-sight, or 4-5 miles, line-of-sight, flat terrain, raised antennas. Provide the ***The Phoenix Contact RAD-ISM-900,,,-UD*** integrated radio & I/O module, or ***an Approved Equal***. Band width of signal utilizes 902-928 MHz Industrial, Scientific and Medical (ISM) band spread spectrum frequency hopping technology.

B. Flow Controller:
1. Flow Controller or Flow Metering Device shall provide flow rate and total flow meters via a pulse output signal. Able to display both totals and flow rates at the same time. Provide the ***Precision Digital Pro Vu display Rate/Totalizer w/ Pulse Inputs & 4-20 Output, or an Approved Equal. NEMA 4X Panel Meter Enclosure required at WTP Interior.*** 1/8 DIN plastic NEMA 4X/IP65 front with dimensions of 8”W x 10”H x 6”D.

2.3 ELECTRICAL SURGE PROTECTION & ENCLOSURE

A. Provide Lightning Arrestor & Termination Enclosure for Submersible Sensors. Provide GE STI 110 NMA 4X-Rated box or Equal. Surge protection shall be installed to protect electrical components in accordance with minimum International Society of Automation (ISA) standards.
1. All field analog instruments shall be protected by surge suppression on the instrument.
2. All analog signals coming from instrumentation to the main panel box shall be protected with surge suppression.
3. All digital input/output signals and instrumentation shall be protected by inline fuses.
4. Transient voltage surge suppression (TVSS) shall be installed at the main power feed and in the main control panel.
5. Insulation and grounding of suppressors shall be in conformance with manufacturer’s recommendations.

2.4 NONMETALLIC CONDUITS
1. SCHEDULE 40 ELECTRICAL PLASTIC CONDUIT: Designed for underground installation with or without concrete encasement and normal duty application above ground and made of polyvinyl chloride (EPC-40-PVC for Type II and III applications). Minimum size shall be 3/4".
2. PVC PLASTIC FITTINGS: Designed to be joined in the field by means of a solvent cement system.
3. SOLVENT CEMENT: ASTM D 2564 or in accordance with raceway manufacturer's printed recommendations.
4. CLAMPS, STRAPS, WALL HANGERS, AND OTHER HARDWARE: Nylon, PVC or PVC-coated to provide the same corrosion resistance as the raceway.
5. DUCT SEALANT: Polywater FST foam duct sealant, or equal.

PART 3 - EXECUTION

3.1 INSTRUMENTATION INSTALLATION

A. General: Equipment specified in this section shall be installed in accordance with the manufacturer's recommendations and all applicable codes.

B. Field Service: The Contractor shall provide experienced personnel to for installation, adjustment, testing, and startup of the system. All elements of the system shall be tested to demonstrate that the total system satisfies all of the requirements of the Contract Documents. The Contractor shall provide all special testing materials and equipment required. The Contractor shall coordinate and schedule all of his testing and startup work with the Owner. As a minimum, the testing shall include both a factory test and a field test.

C. Training: The training program shall educate operators, maintenance, engineering, and management personnel with the required levels of system familiarity to provide a common working knowledge concerning all significant aspects of the system being supplied. The training program shall include a minimum of one trips with a minimum of 6 hours on-site instruction. The supplier shall provide all instructional course material, equipment and manuals to conduct the training program.

3.2 CONDUIT INSTALLATION

1. Install EPC-40-PVC where indicated on the drawings.
2. Install foam duct sealant within ducts entering manholes or buildings.
3. Where conduits will be exposed upon transitioning from below to above grade, transition to appropriate metallic conduit underground.

B. CONDUIT CONNECTION

1. Join raceway by means of solvent cement in accordance with the suggested methods indicated in the appendix of NEMA TC-2 for "normal" service conditions.
2. Install socket type couplings for joining raceway.
3. Install female adapters with female threads on one end and socket end on the other for adapting nonmetallic raceway to threaded metallic raceway.
4. Install terminal adapters for adapting nonmetallic raceway to boxes, threaded fitting, and metallic systems. Male threads on one end, socket end on the other.
5. Connection to NEMA 1 type, metallic boxes: Secure with locknut.
6. Connection to NEMA 3R, 4, 4X, and 12 type, metallic boxes: Install O-ring seal on exterior and sealing locknut on interior.

C. BENDS

1. Bends shall be made with factory elbows or with electric heaters designed specifically for the purpose. The use of torches or other flame-type devices will not be permitted. Sections of raceway showing evidence of scorching (brownish color) will be disapproved.
2. Field bends for 2-inch diameter and larger raceway shall be made using internal support to prevent crimping or deforming during the bending process.
3. All bends for 4-inch conduits shall use long-sweep radii.

D. SUPPORT: Support raceways based on the temperatures at the application, but in no case shall the distance between supports be less than the requirements of NEC. Install raceway at least 6 inches away from steam lines and other heat sources.

END OF SECTION 16900

APPENDIX A

EROSION CONTROL NARRATIVE

DBP REMEDIATION & WATER IMPROVEMENTS
PHASE II
HURT, VIRGINIA

ADDITIONAL PLAN INFORMATION

- EROSION AND SEDIMENT CONTROL NARRATIVE
- STORMWATER MANAGEMENT NARRATIVE
- SWPP ADDITIONAL INFORMATION

Prepared for
Town of Hurt, Virginia

February 2025

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EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION

The purpose of this plan is to install water improvements to the existing Town of Hurt water system. This project is divided into three Divisions. Division I includes the installation of approximately 1000 lf of 12" water main (with approximately 200 lf installed with jack & bore) on the west side of Hurt, VA. The installation of a pressure reducing valve vault is included with Division I as well. Division II includes modifications to the existing Town of Hurt water booster station and installation of approximately 650 lf of 12" water main along Ricky Van Shelton Drive just south of the Town of Altavista Water Treatment Plant. Internal modifications to the Town of Hurt water meter vault to the Pittsylvania community of Grit is included with Division II as well. Division III includes the installation of a mixing and aeration system at the existing Town of Hurt elevated water tank. All work at the tank will be on the tank and will not require and land disturbance. The installation of the Division I water main will be a linear disturbance of approximately 4300 sf or 0.10 acres. The installation of the Division II water main will be a linear disturbance of approximately 3250 sf or 0.07 acres. The total land disturbance will disturb approximately 0.17 acres or 7550 sf.

EXISTING SITE CONDITIONS

Division I construction area is a strip of undeveloped property between US 20 Business (Main Street) and a residential subdivision on Lynn Street. The disturbed areas drains generally through road drainage systems northeast to into the Staunton River approximately 1.0 miles downstream of the project area. Division II construction area is the ROW between the Altavista Water Treatment plant driveway and existing pump station. The disturbed areas drains into a road drainage systems northeast to into the Staunton River approximately 1000 ft downstream of the project area. Division III construction area is on the existing tank property.

ADJACENT PROPERTY

The adjacent areas of Division I are residential to the east with light industrial to the north, south and west. The adjacent areas of Division II is the water treatment plant to the east with light commercial to the west. The area adjacent to Division III is medium lot residential to the north with an existing hay field to the east, west and south.

OFF-SITE AREAS

Any off-site area disturbed by the contractor will have to be protected with any required erosion control measures. There are not off-site areas planned at this time.

SOILS

The soils of this site are primarily Cecil fine sandy loam, Turbeville fine sandy loam and Worsham soils.

CRITICAL EROSION AREAS

The critical erosion areas will be the trench excavations in Division II due to the proximity to the river. All steep slopes will be stabilized with erosion control matting, flexamat, or riprap.

EROSION AND SEDIMENT CONTROL MEASURES

The purpose of the control measures will be to prevent sediment deposition off the disturbed trench area. Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the handbook. The minimum standards of the VESCR shall be adhered to unless otherwise waived or approved by a variance.

COMPLY WITH MINIMUM STANDARD 16 (MS-16) FROM VESCR

MS 16- Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:

a. No more than 500 linear feet of trench may be opened at one time.
b. Excavated material shall be placed on the uphill side of trenches.
c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.

d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
e. Restabilization shall be accomplished in accordance with these regulations.
f. Applicable safety regulations shall be complied with.

STRUCTURAL PRACTICES

1. Silt Fence Barrier– C-PCM-01: Install silt fence downstream of disturbed areas if not in compliance with MS-16 or as required due to poor stabilization of surface.
2. Erosion Control Matting (Treatment 1)– C-SSM-05: Install matting in disturbed areas to ensure permanent vegetative stabilization. Install within ditches when flow line of the ditch is disturbed by construction.

VEGETATIVE PRACTICES

1. Topsoiling – C-SSM-02: Topsoil shall be stripped from all the trench area and respread after backfill of the trench. Approval of the inspector will be required for the location of any stockpiles.
2. Temporary and Permanent Seeding – C-SSM-09 & C-SSM-10: Permanent or temporary seeding shall be applied to any denuded areas left dormant within 15 days of disturbance. Seed mix shall depend upon the recommendations of the VESC Handbook and the time of year.
3. Mulching – C-SSM-11: Mulch shall be applied as required to all areas with grass seeding or landscape plantings.
4. Soil Stabilization Blankets and Matting– C-SSM-05: Install matting as shown on steep slopes and to revegetate stream banks as labeled on the plans.

MANAGEMENT STRATEGIES

1. Construction will be sequenced so that grading operations can begin and end as quickly as possible.
2. Runoff from disturbed areas not stabilized per MS-16 will be directed into sediment traps, check dams, or through silt fence.
3. Temporary seeding or other stabilization will follow immediately after backfill of trench.
4. The job superintendent will be responsible for the installation and maintenance of all erosion and sediment control practices.
5. After achieving adequate stabilization, the select temporary E & S controls will be cleaned up and removed. The inspector will determine when measures may be removed.

CONSTRUCTION SCHEDULE-WATER MAINS

1. Install all temporary measures as practical.
2. Excavate trench, install pipe, and backfill trench.
3. Stabilize trench in accordance with MS-16.
4. Final grading and permanent stabilization.
5. All temporary E & S controls will remain in place until specified by the Engineer.

PERMANENT STABILIZATION

All areas disturbed by construction and not paved will be stabilized with permanent seeding as soon as final grading of each area is complete. Seeding mix will consist of seeds as required by standard 3.32. Mulch per standard 3.35 and Matting per standard 3.36 will be used to protect permanent seeding areas.

MAINTENANCE

All erosion and sediment control measures will be checked weekly and after each significant rainfall. The following areas will be checked in particular.

1. Stabilized areas will be checked weekly to ensure that the surface coating (grass seed, stone, asphalt) is sufficient to minimize erosion runoff.
2. The silt fence barrier will be checked regularly for undermining or deterioration of the fabric. Sediment shall be removed when the level of sediment deposition reaches half way to the top of the barrier.
3. The seeded areas will be checked regularly to ensure that a good stand of grass is maintained. Areas should be fertilized and re-seeded as necessary.

STORMWATER MANAGEMENT NARRATIVE

MS-19 REQUIREMENTS-STORM WATER QUANTITY

Since this plan does not include an increase in impervious area, there will be no runoff increase from pre-development to post development.

STORM WATER QUALITY REQUIREMENTS

Since the limits of disturbance for this plan are less than 1 acre, there will be no stormwater quality management.

SWPP ADDITIONAL INFORMATION

CONTRACTOR WILL COMPLY WITH ALL THE PROVISIONS OF THE VSMP AND/OR SWPP PERMIT INCLUDING INSPECTION, MAINTENANCE, AND REPORTING REQUIREMENTS.

Possible additional pollution sources:
Vehicle fueling

Construction and Waste materials to be stored on-site
Pipe -no discharge associated
Bedding and base stone-protected with silt fence

Contractor may not discharge or waste materials into water bodies.

Structural erosion control methods and practices have been selected based on availability to the contractor, cost of construction & maintenance, and practical use in this particular application.

Contractors will comply with the following GM15-2003 Requirements for the waterline work:

Contractor will comply with the following requirements:

- The project is managed so that less than one (1) acre of land disturbance occurs on a daily basis;
- The disturbed land where work has been completed is adequately stabilized on a daily basis;
- The environment is protected from erosion and sedimentation damage associated with the land-disturbing activity
- The construction activity operator designs, installs, implements, and maintains pollution prevention measures to:
    - Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters;
    - Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on-site to precipitation and to stormwater;
    - Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures;
    - Prohibit the discharge of wastewater from the washout of concrete;
    - Prohibit the discharge of wastewater from the washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials; and
    - Prohibit the discharge of fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
- **The project does not significantly alter the predevelopment runoff characteristics of the land surface after the completion of construction and final stabilization.**

APPENDIX B

VDOT LUP DOCUMENTS

Commonwealth of Virginia
Department of Transportation
PERMIT 01/2011

LUP-ESCCC
LAND USE
Special Provision

VDOT Erosion & Sediment Control Contractor Certification

In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification § 107.14 (a), Special Provision 107D, all contractors performing regulated land disturbing activities within VDOT right-of-way must have an employee that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training. Regulated land disturbing activities are defined as those activities that disturb 2,500 square feet or greater in Tidewater, Virginia (as defined in § 10.1-2101 of the Code of Virginia) or 10,000 square feet or greater in all other areas of the State. The Department will require evidence of this certification with any Land Use Permit application that involves utility and/or commercial right of way improvement.

NON-COMPLIANCE MAY RESULT IN PERMIT SUSPENSION &/OR A STOP WORK ORDER

Applicant/Project Name:_____

Contractor:_____

Route Number:_____ **County:**_____

I, _____, as representative for the permit applicant, acknowledge that the permittee must have an individual that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training on site during all land disturbance activities. This individual will be responsible for insuring compliance with all applicable local, state and federal erosion and sediment control regulations during land disturbance activities and will provide evidence of said certification upon request from VDOT personnel.

_____ *Work on this project involves less than 2,500 square feet or 10,000 square feet of land disturbance activities, whichever is applicable, and therefore is exempt from this reguirement.*

_____

Signature *Date*

THIS DOCUMENT MUST ACCOMPANY THE VDOT LAND USE PERMIT APPLICATION

NOTE: Training for the VDOT Erosion & Sediment Control Contractor Certification can be obtained through the Virginia Transportation Construction Alliance at: htpp//www.vtca.org

DESIGN SPEED	DESIGN ADT	FORESLOPES			BACKSLOPES		
		6:1 or Flatter	5:1 to 4:1	3:1	3:1	5:1 to 4:1	6:1 or Flatter
40 mph or less	Under 750[c]	7-10	7-10	[b]	7-10	7-10	7-10
	750-1500	10-12	12-14	[b]	12-14	12-14	12-14
	1500-6000	12-14	14-16	[b]	14-16	14-16	14-16
	Over 6000	14-16	16-18	[b]	16-18	16-18	16-18
45-50 mph	Under 750[c]	10-12	12-14	[b]	8-10	8-10	10-12
	750-1500	14-16	16-20	[b]	10-12	12-14	14-16
	1500-6000	16-18	20-26	[b]	12-14	14-16	16-18
	Over 6000	20-22	24-28	[b]	14-16	18-20	20-22
55 mph	Under 750[c]	12-14	14-18	[b]	8-10	10-12	10-12
	750-1500	16-18	20-24	[b]	10-12	14-16	16-18
	1500-6000	20-22	24-30	[b]	14-16	16-18	20-22
	Over 6000	22-24	26-32[a]	[b]	16-18	20-22	22-24
60 mph	Under 750[c]	16-18	20-24	[b]	10-12	12-14	14-16
	750-1500	20-24	26-32[a]	[b]	12-14	16-18	20-22
	1500-6000	26-30	32-40[a]	[b]	14-18	18-22	24-26
	Over 6000	30-32[a]	36-44[a]	[b]	20-22	24-26	26-28
65-70[d] mph	Under 750[c]	18-20	20-26	[b]	10-12	14-16	14-16
	750-1500	24-26	28-36[a]	[b]	12-16	18-20	20-22
	1500-6000	28-32[a]	34-42[a]	[b]	16-20	22-24	26-28
	Over 6000	30-34[a]	38-46[a]	[b]	22-24	26-30	28-30

Source: AASHTO Roadside Design Guide, Chapter 3.

TABLE A-2-1
CLEAR ZONE DISTANCES (IN FEET FROM EDGE OF DRIVING LANE)*

a. When a site specific investigation indicates a high probability of continuing crashes, or when such occurrences are indicated by crash history, the designer may provide clear zone distances greater than the clear zone shown in Table A-2-1. Clear zones may be limited to 30 feet for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance.

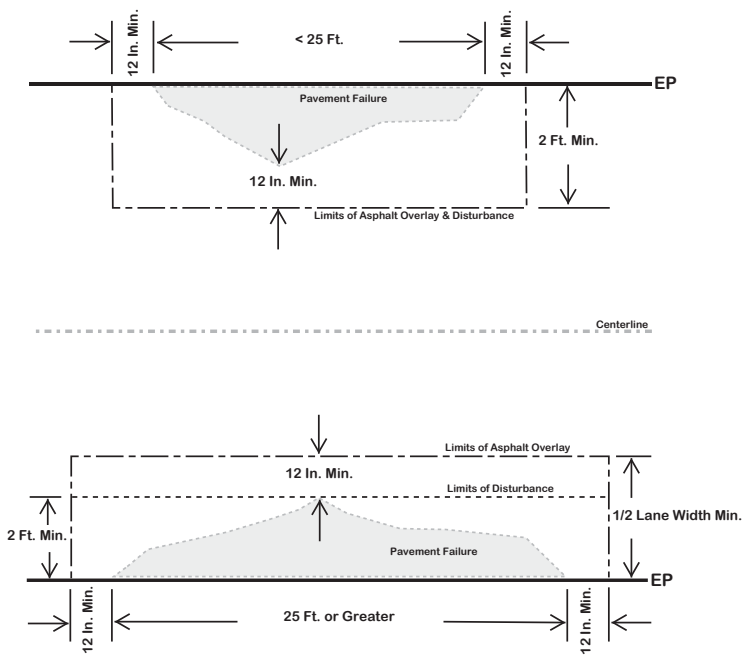
b. Because recovery is less likely on the unshielded, traversable 3:1 fill slopes, fixed objects should not be present in the vicinity of the toe of these slopes. Recovery of high speed vehicles that encroach beyond the edge of shoulder may be expected to occur beyond the toe of slope. Determination of the width of the recovery area at the toe of slope should take into consideration right of way availability, environmental concerns, economic factors, safety needs, and crash histories. Also, the distance between the edge of the travel lane and the beginning of the 3:1 slope should influence the recovery area provided at the toe of slope. While the application may be limited by several factors, the fill slope parameters which may enter into determining a maximum desirable recovery area are illustrated in FIGURE A-2-4. A 10 foot recovery area at the toe of slope should be provided for all traversable, non recoverable fill slopes.

c. For roadways with low volumes it may not be practical to apply even the minimum values found in Table A-2-1. Refer to Chapter 12 for additional considerations for low volume roadways and Chapter 10 for additional guidance for urban applications in AASHTO Roadside Design Guide.

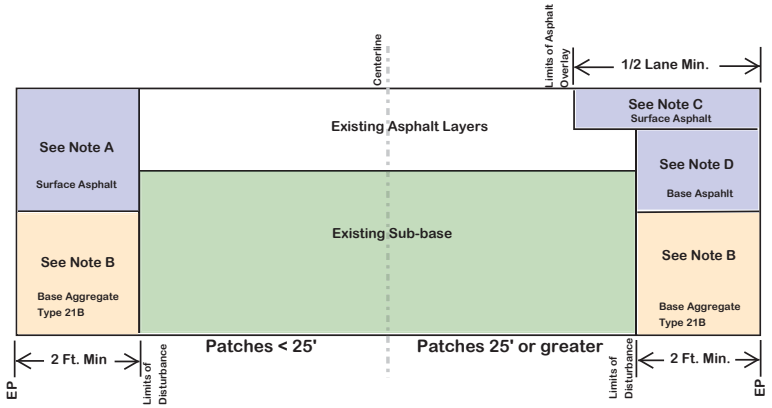
d. When design speeds are greater than the values provided, the designer may provide clear zone distances greater than those shown in Table A-2-1.

* Rev. 1/12

PLAN VIEW (Not to Scale)



MINIMUM TYPICAL PAVEMENT SECTION (Not to Scale)



BRISTOL DISTRICT PLANNING & INVESTMENT MANAGEMENT DIVISION

Longitudinal Pavement Patching for Pavement Failures Resulting From Utility Installations in Roadway Shoulders

Effective 09 September 2015

GENERAL NOTES:

1: Sub-base preparation shall extend a minimum of 12 inches beyond the limits of disturbance (both length and width) for all patches, but in no case shall the width be less than 2 feet.

2: A liquid asphalt tack coat shall be applied to all saw-cut or milled edges of existing pavement prior to placing asphalt patches.

3: For asphalt patches less than 25 ft in length, the existing asphalt shall be saw-cut to provide a uniform pavement joint:
- a: The patch width shall be a minimum of 12 inches beyond the limits of disturbance, but in no case shall it be less than 2 feet.
- b: The patch length shall be a minimum of 12 inches beyond the limits of disturbance on each end.

4: For asphalt patches 25 ft in legnth or greater, the existing asphalt shall be saw-cut or milled to provide a uniform pavement joint:
- a: The patch width shall be a minimum of 12 inches beyond the limits of disturbance, but in no case shall it be less than one-half of the lane width.
- b: The patch length shall be a minimum of 12 inches beyond the limits of disturbance on each enad.

5: VDOT may modify the minimum typical pavement section given herein based on the type of roadway, the amount of pavement damage, and/or the existing pavement typical section.

6: Density requirements for sub-base material and asphalt concrete shall be in accordance with the current edition of the Virginia Department of Transportation Road & Bridge Specifications.

7: Any disturbed pavement markings shall be replaced immediately upon completion of the asphalt patching and shall be in accordance with the current editions of the Virginia Department of Transportation Road & Bridge Specifications and the Virginia Department of Transportation Road & Bridge Standards.

8: The amount of patching required shall be determined by VDOT personnel based upon a field inspection.

MINIMUM TYPICAL PAVEMENT SECTION NOTES:

Note A: Depth of asphalt patch shall a minimum of 1.5 times the depth of the existing asphalt layers, but in no case shall it be less than 3 inches. Asphalt shall be type SM12.5A or SM19.0A

Note B: The contractor shall excavate the disturbed area and re-compact with a minimum of 6 inches of Aggregate Type 21B

Note C: For patches 25 ft or greater in length, the contractor may elect to mill the existing surface asphalt to a depth no less than two inches and a width no less than one-half the lane width. However, should the contractor elect to to saw-cut and remove existing asphalt down to the sub-base, the sub-base must be prepared in accordance with Note B. Surface asphalt shall be Type SM12.5A or SM19.0A

Note D: For patches 25 ft or greater, the contractor shall place a minimum of 3 inches base mix asphalt Type BM25.0. The combined depth of the base asphalt and the surface asphalt shall be a minimum of 1.5 times the depth of the existing asphalt layers.

Proposed asphalt layers

Existing asphalt layers

Proposed sub-base layers

Existing sub-base layers

LAND USE PERMIT
LUP-OC
Open-Cut Pavement Restoration Requirements
August 27, 2014

Permittee Agreement for Land Use Permit Issuance

I the undersigned hereby acknowledge that I am fully cognizant of all of the following requirements associated the restoration of pavement impacted by open cut pavement trenching operations on state maintained highways:

Applicant Name: _____

Applicant Signature: _____

Project Name: _____

District: _____ County: _____Route Number: _____

Any of the following provisions that may apply, shall apply:

1) The permittee shall be responsible for the restoration of pavement on state maintained highways in accordance with all applicable sections of the VDOT Road and Bridge Specifications, VDOT Road and Bridge Standards and this document.

2) Whenever existing pavement is permitted to be cut, not over one-half of the roadway width shall be disturbed at one time and the first open cut trench section shall be satisfactorily restored to allow for the passage of traffic prior to the second half of the roadway surface can be disturbed.

3) All trench backfill material shall be Select Material Type I having a minimum CBR of 30 and free from any wood, decaying material, asphalt, concrete, ice, frost, large clods, stone or debris.

4) Trench backfill material shall be compacted to a minimum of 95% of the theoretical maximum density at optimum moisture content, as determine by VDOT testing procedures (VTM1), using mechanical tamping throughout the depth of the trench in 6-inch lifts to ensure that the adequate support is provided for the aggregate sub-base layer is adequately supported.

5) For roadways with a bituminous concrete asphalt pavement section the compacted trench backfill shall be capped with 10 inches (10”) of Type I, Size 21-A or 21-B aggregate compacted to 100% of the theoretical maximum density at optimum moisture content covering the entire trench width and a minimum six inch (6”) bench on each side of the excavated trench or as determined by the district administrator’s designee.

6) A bituminous concrete asphalt base course (BM-25) having a minimum thickness of six inches (6”), or matching the existing base course thickness, shall be placed over the benched aggregate sub-base to the bottom elevation of the existing asphalt concrete surface course.

7) All sides of the excavated trench shall be saw-cut trimmed to neat straight lines and a tack coat of RC-250 liquid asphalt applied at a rate of 0.1 gallon per square yard (or as determined by the district administrator’s designee) prior to placing the bituminous concrete asphalt base course (BM-25.0) and/or replacement of the bituminous concrete asphalt surface course (SM-9.5A or SM-9.5D).

8) The existing pavement surface course adjacent to the excavated trench shall be milled and repaved with bituminous concrete asphalt (SM-9.5A or SM-9.5D) having of a minimum thickness of 1-1/2 inches (1.5”). This operation shall cover the entire trench width and extend 12 inches (12”) beyond the edge of the trench on longitudinal open cuts and 25 feet (25’) beyond the trench centerline on perpendicular open cuts, or as determined by the district administrator’s designee.

9) Open cuts in surface treated roadway sections with an aggregate base course shall be replaced with the same layer(s) as roadway sections with a bituminous concrete asphalt pavement structure except the sub-base layer (Type I, Size 21-A or 21-B) may be reduced to six inches (6”) and the bituminous concrete asphalt base layer (BM-25.0) may be reduced to four inches (4”) while maintaining the required six inch (6”) bench on both sides of the excavated trench. The surface course restoration material and thickness shall match the existing surface.

10) Replacement of all bituminous concrete asphalt and surface treated courses shall be rolled with equipment having a manufacturer’s rating of ten (10) tons until the aggregate is keyed into the bitumen. Where rolling is not possible, a mechanical tamper shall be utilized.

11) Full depth aggregate stone may be placed in the trench daily up to maximum length of 500 feet, at which time either temporary or permanent pavement restoration procedures must be implemented.

12) Should the application of the bituminous concrete asphalt surface course be delayed due to adverse weather conditions, the contractor shall provide and maintain a temporary pavement section that is acceptable to the district administrator’s designee until such time as the appropriate permanent pavement restoration can be achieved.

13) The permittee shall be responsible for any settlement in the backfill or pavement for a period of two (2) years after the completion date of permit and for the continuing maintenance of the facilities placed within the highway right-of-way.

14) A one-year restoration warranty period may be considered, provided the permittee adheres to the following criteria:

- The permittee retains the services of a professional engineer (or certified technician under the direction of the professional engineer) to observe the placement of all fill embankments, pavement, and storm sewer and utility trench backfill.
- The professional engineer (or certified technician under the direction of the professional engineer) performs any required inspection and testing in accordance with all applicable sections of VDOT's Road and Bridge Specifications.
- The professional engineer submits all testing reports for review and approval, and provides written certification that all restoration procedures have been completed in accordance with all applicable sections of VDOT's Road and Bridge Specifications prior to completion of the work authorized by the permit.

15) The district administrator’s designee may request and review the backfill compaction test results and/or authorize an inspector to monitor the trench backfill and compaction operations.

16) The use of steel plates to provide a temporary riding surface will not be allowed between November 1 and April 1. The use of steel plates between April 2 and October 31 shall be in accordance with VDOT standards and specifications.

17) Traffic shall be maintained at all times in accordance with the Virginia Work Area Protection Manual and a VDOT approved Maintenance of Traffic (MOT) plan.

18) The permittee shall notify the district administrator's designee a minimum of 72 hours prior to initiating any pavement open cutting operations.

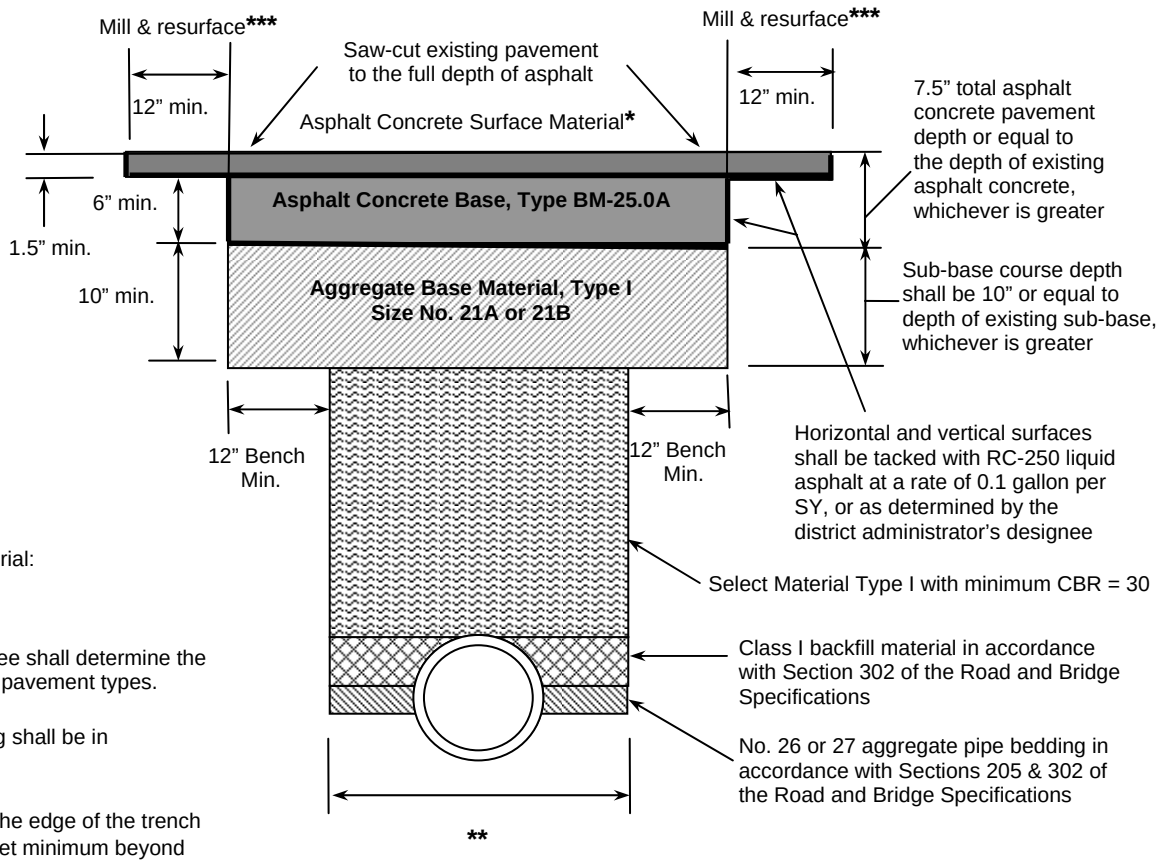
19) The trench to be backfilled shall be made as dry as practicable at the time of backfilling by pumping, bailing, draining, or other approved dewatering method.

20) All asphalt pavement restoration activities shall be in accordance with the Asphalt Pavement Restoration Detail for Open Cut Utility Installations contained herein.

Permittee Notice

The preceding provisions are intentionally condensed in format and should not be loosely interpreted by the permittee without consultation with the central office permit manager and affirmation from the **Land Use Permit Regulations**.

Asphalt Pavement Restoration Detail for Open Cut Utility Installations



NOTES:

***** Asphalt Concrete Surface Material:
SM-9.5A for ADT < 10,000
SM-9.5D for ADT > 10,000

The district administrator's designee shall determine the restoration requirements for other pavement types.

****** Trench width and pipe bedding shall be in accordance with VDOT Std. PB-1

******* 12 inches minimum beyond the edge of the trench on longitudinal open cuts, or 25 feet minimum beyond the trench centerline on perpendicular open cuts, or as determined by the district administrator's designee.

Date: August 27, 2014

Not to Scale

LAND USE PERMIT
LUP-ESCCC
Erosion & Sediment Control Contractor Certification

March 10, 2016

In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification 107.14 (a), Special Provision 107D, all contractors performing regulated land disturbing activities within VDOT right-of-way must have an employee that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training. Regulated land disturbing activities are defined as those activities that disturb 2,500 square feet or greater in Tidewater, Virginia or 10,000 square feet or greater in all other areas of the State. The Department will require evidence of this certification with any Land Use Permit application that involves utility and/or commercial right-of-way improvement.

NON-COMPLIANCE MAY RESULT IN PERMIT SUSPENSION &/OR A STOP WORK ORDER

Applicant/Project Name: _____

Contractor: _____

District: _____ County: _____ Route Number: _____

Please select one of the following:

[ ] In accordance with the VDOT Road & Bridge Specification 107.14 (a), Special Provision 107D, I, _____, as representative for the permit applicant, acknowledge that the permittee must have an individual that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training on site during all land disturbance activities. This individual will be responsible for insuring compliance with all applicable local, state and federal erosion and sediment control regulations during land disturbance activities and will provide evidence of said certification upon request from VDOT personnel.

[ ] Land disturbance within VDOT right-of-way on this project is less than 2,500 or 10,000 square feet, whichever is applicable, and is therefore exempt from the Erosion & Sediment Control Contractor Certification requirements outlined in § 107.16(a) of the current VDOT Road & Bridge Specifications.

_____

Signature *Date*

THIS DOCUMENT MUST ACCOMPANY THE VDOT LAND USE PERMIT APPLICATION

NOTE: Training for the VDOT Erosion & Sediment Control Contractor Certification can be obtained from any of the sources listed under "Upcoming Courses" at: ***http//www.virginiadot.org/business/pr-essce-main.asp***

LAND USE PERMIT
LUP-SPG
Special Provisions – General

VDOT Land Use Permit Required by Law

The General Rules and Regulations of the Commonwealth Transportation Board provide that no work of any nature shall be performed on any real property under the ownership, control, or jurisdiction of VDOT until written permission has been obtained from VDOT. Written permission is granted for the above-referenced activity through the issuance of a land use permit.

By issuing a permit, VDOT is giving permission only for whatever rights it has in the right-of-way; the permittee is responsible for obtaining permission from others who may also have an interest in the property.

The permittee will be civilly liable to the Commonwealth for expenses and damages incurred by VDOT as a result of violation of any of the rules and regulations of this chapter. Violators shall be guilty of a misdemeanor and, upon conviction, shall be punished as provided for in §33.2-210 of the Code of Virginia.

Application Requirements

Application shall be made for VDOT land use permits through the local district permit office where the activity is to take place.

Application forms and general information regarding VDOT land use permitting can be obtained by contacting the central office permit manager or at the following VDOT web site: http://www.virginiadot.org/business/bu-landUsePermits.asp

The applicant shall provide a notarized affidavit indicating compliance with the registration and notification requirements outlined in § 2.2-1151.1 of the Code of Virginia.

Permit Fees

The land use permit application shall include a check in an amount determined by the district administrator's designee based on the schedule found in 24VAC30-151-710 of the Land Use Permit Regulations.

Surety Requirement

A performance surety in the amount determined by the district administrator's designee is required to restore the right-of-way in the event of damage or default. This surety may be in the form of cash, check or surety bond LUP-SB, or LUP-LC irrevocable letter of credit.

Cash Surety Refund

Applicants owing the Internal Revenue Service or the Commonwealth of Virginia may not receive a refund of the cash guarantee provided for the issuance of a VDOT land use permit unless the amount owed is less than the amount of cash guarantee provided. Applicants providing cash guarantee for the issuance of a VDOT land use permit must provide an executed copy of the Commonwealth of Virginia's Substitute Form W-9 to receive a refund of the cash guarantee provided for the issuance of a VDOT land use permit.

Insurance Requirements (excluding County, Town or City)

The permittee or their agent shall secure and maintain insurance to protect against liability for personal injury and property damage that may arise from the activities performed under the authority of a land use permit and from the operation of the permitted activity up to one million dollars ($ 1,000,000) each occurrence to protect the Board members and the Department's agents or employees; seventy-five thousand dollars ($75,000) each occurrence to protect the Board, the Department, or the Commonwealth in event of suit. Insurance must be obtained prior to start of the permitted work and shall remain valid through the permit completion date. VDOT staff may require a valid certificate or letter of insurance from the issuing insurance agent or agency prior to issuing the land use permit.

Any of the following provisions that may apply, shall apply:

General Requirements

1) Permittee acceptance and use of a Virginia Department of Transportation (VDOT) land use permit is prima facie evidence that the permittee has read and is fully cognizant of all required permit provisions, applicable traffic control plans and associated construction standards to be employed. All applicants to whom permits are issued shall at all times indemnify and save harmless the

Commonwealth Transportation Board, members of the Board, the Commonwealth, and all Commonwealth employees, agents, and officers, from responsibility, damage, or liability arising from the exercise of the privileges granted in such permit to the extent allowed by law including any sums ordered to be paid or expended by VDOT by any governmental entity as a fine, penalty or damages for any violation of any applicable environmental law, or to remediate any hazardous or other material, including illicit discharge into VDOT maintained storm sewer systems.

2) The permittee assumes full responsibility for any and all (downstream flooding, erosion, siltation, etc.) damages that may occur as a result of the work performed under this permit. Furthermore, the Department will in no way be responsible for any damage to the facility being placed as a result of future maintenance or construction activities performed by the Department.

3) The permittee agrees to move, remove, alter, or change any installation that interferes with the ultimate construction of the highway in alignment or grade at no cost to the Department unless otherwise stipulated and agreed to by the Department.

4) The permittee shall immediately correct any situation that may arise as a result of these activities that the district administrator's designee deems hazardous to the traveling public.

5) Any and all highway signs, right-of-way markers, etc., disturbed as a result of work performed under the auspices of a land use permit shall be accurately reset by the permittee immediately following the work in the vicinity of the disturbed facility. The services of a certified land surveyor with experience in route surveying may be required.

6) It shall be the permittee's responsibility to obtain any and all necessary permits that may be required by any other government agencies, i.e., U.S. Army Corp. of Engineers, Department of Environmental Quality, Department of Conservation and Recreation, etc.

7) A copy of the VDOT land use permit shall be maintained at the work site and made readily available for inspection when requested by authorized VDOT personnel. District administrator's designee may request the permittee to install on site a project information sign to help the public and VDOT personnel identify activities in the right of way (see LUP-IS).

8) The permittee shall notify the local district permit office at least 48 hours prior to commencement of any work requiring inspection and/or testing as stipulated in VDOT's Road and Bridge Standards (current edition) and VDOT's Road and Bridge Specifications (current edition). Failure to carry out this requirement may result in permit revocation.

9) The permittee or their agent must contact the VDOT Customer Service Center at 1-800-367-7623 a minimum of 48 hours prior to initiating any planned excavation within 1,000 feet of a signalized intersection and/or near VDOT ITS infrastructure. Excavation activities may proceed only after the VDOT regional utility location agent has notified the permittee that the utility marking has been completed. Additional information can be found at: http://www.virginiadot.org/business/resources/IIM/TE-383_Request_for_Marking_VDOT_Utility_Location.pdf

   Alternately, within all localities in the Northern Virginia Construction District, including the Counties of Arlington, Fairfax, Loudoun & Prince William, the Cities of Alexandria, Fairfax, Falls Church, Manassas and Manassas Park, and the Towns of Clifton, Dumfries, Hamilton, Haymarket, Herndon, Hillsboro, Leesburg, Lovettsville, Middleburg, Occoquan, Purcellville, Quantico, Round Hill and Vienna, and on Interstate 95 in the counties of Stafford, Spotsylvania and Caroline, the permittee may request VDOT regional utility marking at: http://www.vdotutilitymarking.virginia.gov

10) The permittee shall to notify "Miss Utility" (or each operator of an underground utility where no notification center exists) of any planned excavation within state maintained right-of-way. This notification must be provided at least 48 hours (excluding weekends and holidays) in advance of commencing with any planned excavation within state maintained right-of-way. Failure to carry out this requirement may result in permit revocation.

11) It is the duty of the district administrator's designee to keep all roads maintained in a safe and travelable condition at all times. Therefore, any permit may be denied, revoked or suspended when in the opinion of the district administrator's designee, the safety, use or maintenance of the highway so requires.

12) The permittee shall at all times give strict attention to the safety and rights of the traveling public, their employees and themselves. VDOT reserves the right to stop work at anytime due to safety problems and/or non-compliance with the terms of the permit. The Department may, at its discretion, complete any of the work covered in the permit or restore the right-of-way to the department's standards and invoice the permittee for the actual cost of such work. The permittee may be required to move, alter, change or remove from state maintained right-of-way, in a satisfactory manner, any installation made under this permit.

13) All work authorized under the auspices of a VDOT land use permit shall be subject to VDOT's direction and be in accordance with VDOT's Road and Bridge Standards (current edition) and VDOT's Road and Bridge Specifications (current edition).

14) Design changes, specified material changes and/or field changes from the approved plans shall be submitted to the appropriate district administrator's designee for review and approval prior to proceeding with the proposed changes. This submittal shall include written justification, supplemental documentation and/or engineering calculations that support the requested changes.

15) The permittee shall meet or exceed the existing pavement design and typical section when constructing pavement widening adjacent to an existing state maintained roadway. The proposed pavement design and typical section shall be approved by the district administrator's designee prior to commencing with any work within state maintained right-of-way. All pavement widening shall be in accordance with VDOT's Road and Bridge Standard 303.02.

16) Within the limits of a VDOT construction project it is the responsibility of the permit applicant to obtain the contractor's consent in writing prior to permit issuance. Information regarding current and/or planned VDOT construction and maintenance activities can be obtained at: http://www.virginiaroads.org/.

Traffic Control and Safety

1) The permittee shall at all times give strict attention to the safety and rights of the traveling public, their employees, and contractors. Any permit may be revoked or suspended when in the opinion of the district administrator's designee, the safety, use or maintenance of the highway so requires.

2) In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification, Special Provision 105.14, all activities performed under the auspices of a VDOT Land Use Permit involving the installation, maintenance and removal of work zone traffic control devices must have an individual on-site who, at a minimum, is accredited by VDOT in Basic Work Zone Traffic Control. The accredited person must have their VDOT Work Zone Traffic Control accreditation card in their possession while on-site.

3) The individual accredited in Basic Work Zone Traffic Control is responsible for the placement, maintenance and removal of work zone traffic control devices within the project limits in compliance with the permit requirements and conditions, the approved plans and specifications, the Virginia Work Area Protection Manual, and the Manual of Uniform Traffic Control Devices.

4) A person accredited by VDOT in Intermediate Work Zone Traffic Control must be on-site to provide supervision for adjustment to the approved layout of any standard Typical Traffic Control (TTC) layouts outlined in the Virginia Work Area Protection Manual.

5) All traffic control plans shall be prepared by a person verified by VDOT in Advanced Work Zone Traffic Control.

6) Individuals responsible for implementation of work zone traffic control measures shall provide evidence of their accreditation upon request from VDOT personnel.

7) The permittee shall be exempt from the requirements of Virginia Department of Transportation (VDOT) Road and Bridge Specification, Special Provision 105.14 if the authorized activity is not within the roadway (as defined in 24VAC30-151) of a state maintained highway.
8) Non-compliance with the requirements outlined in VDOT Road and Bridge Specification, Special Provision 105.14 may result in a stop work order and / or permit revocation.

9) All activities that require the disruption (stoppage) of traffic shall utilize VDOT certified flaggers. Flag persons shall be provided in sufficient number and locations as necessary for control and protection of vehicular and pedestrian traffic in accordance with the Virginia Work Area Protection Manual. All flaggers must have their certification card in their possession when performing flagging operations within state maintained right-of-way. Any flag person found not in possession of his/her certification card shall be removed from the flagging site and the district administrator's designee will suspend all permitted activities.

10) Any VDOT certified flag person found to be performing their duties improperly shall have their certification revoked.

11) All signs shall be in accordance with the current edition of the Manual of Uniform Traffic Control Devices (MUTCD).

12) The permittee shall immediately correct any situation that may arise as a result of these activities that the district administrator's designee deems hazardous to the traveling public.

13) During authorized activities, the permittee shall furnish all necessary signs, flag persons and other devices to provide for the protection of traffic and workers in accordance with the Virginia Work Area Protection Manual or as directed by the district administrator's designee.

14) Traffic shall not be blocked or detoured without permission, documented in writing or electronic communication, being granted by the district administrator's designee.

15) All lane or shoulder closures on highways in the Northern Virginia construction district classified as arterial or collector routes must be authorized, documented in writing or by electronic communication by the VDOT Transportation Operations Center (NRO/TOC).

16) If directed by the district, requests for the implementation of temporary lane closures must be entered into the VDOT Lane Closure Advisory Management System (LCAMS) and VaTraffic a minimum of one (1) week prior to the planned execution of lane closure activities on state maintained highways. The permittee or their contractor(s) may enter their requests directly or provide written requests to the VDOT Regional Operations Center as follows:

- Lane closure requests in all the counties listed below are within the Northern Region and shall be sent to: nrolaneclosurerequests@vdot.virginia.gov.

  Counties: Arlington, Fairfax, Loudoun, Prince William, Spotsylvania, and Stafford

- Lane closure requests in all the counties listed below are within the Northwest Region and shall be sent to: StauntonTrafficManagementCenter@vdot.virginia.gov.

  Counties: Albemarle, Alleghany, Augusta, Bath, Clarke, Culpeper, Fauquier, Fluvanna, Frederick, Greene, Highland, Louisa, Madison, Orange Page, Rappahannock, Rockbridge, Rockingham, Shenandoah and Warren

- Lane closure requests in all the counties listed below are within the Southwest Region and shall be sent to: SalemSmartTrafficCenter@VDOT.Virginia.gov.

  Counties: Amherst, Appomattox, Bedford, Bland, Botetourt, Buchanan, Buckingham, Campbell, Carroll, Charlotte, Craig, Cumberland, Dickenson, Floyd, Franklin, Giles, Grayson, Halifax, Henry, Lee, Montgomery, Nelson, Patrick, Pittsylvania Prince Edward, Pulaski, Roanoke, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe.

- Lane closure requests in all the counties listed below are within the Eastern Region and shall be sent to: HamptonRoadsTOCControllers@VDOT.Virginia.gov.

  Counties: Accomack, Greensville, Isle of Wight, James City, Northampton, Southampton, Surry, Sussex and York

- Lane closure requests in all the counties listed below are within the Central Region and shall be sent to: RichmondDist.SmartTraffic@vdot.virginia.gov

  Counties: Amelia, Brunswick, Caroline, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Hanover, Henrico, King and Queen, King George, King William, Lancaster, Lunenburg, Mathews, Mecklenburg, Middlesex, New Kent, Northumberland, Nottoway, Powhatan, Prince George, Richmond, and Westmoreland

  Written requests for implementation of temporary lane closures must be submitted to the appropriate VDOT Regional Operations Center by close of business on the preceding Wednesday for the upcoming week's planned lane closures. All requests being directly input into LCAMS and VaTraffic must be entered no later than 2:00 pm on the preceding Thursday for the upcoming week's lane closure activities. Any conflicts with other roadway work must be resolved by close of business on Thursday the week prior to the scheduled lane closure activities with documented resolution sent to the VDOT point of contact provided by the regional traffic operation center LCAMS Administrator. Any requests received after these time limitations will not be approved and the proposed work within VDOT right of way requiring lane closures must be rescheduled.

  Lane closure requestors wanting direct access to LCAMS and VaTraffic must complete ITD-35E & ITD-36E forms and return to Ms. Carlene McWhirt at Carlene.McWhirt@VDOT.Virginia.gov. Online training is available for LCAMS and VaTraffic and VDOT can accommodate any additional training needs. Please contact Ms. McWhirt at (571) 350-2078 to schedule training.

VIRGINIA WORK ZONE TRAFFIC CONTROL TRAINING OPTIONS

The following three options are available to receive Work Zone Traffic Control (WZTC) training based on an individual's job duties and responsibilities as required by the FHWA Final Rule on Work Zone Safety and Mobility and the Virginia Department of Transportation:

OPTION 1 – Have someone trained to become a qualified instructor in your company who can then instruct others , utilizing training material provided by VDOT. The following qualifications must be met in order to teach the VDOT Basic, Intermediate, or Advanced WZTC training courses:

- Basic – Be flagger certified either by VDOT or by the American Traffic Safety Services Association (ATSSA); possess two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; possess two years of

documented experience in conducting training courses; and successfully complete the VDOT WZTC Intermediate or Advanced course or complete the ATSSA Virginia Intermediate/Traffic Control Supervisor (TCS) course.

- Intermediate - Be flagger certified either by VDOT or by ATSSA; possess two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; possess two years of documented experience in conducting training courses; complete and possess the ATSSA Virginia Intermediate/TCS certification.

- Advanced - Be flagger certified either by VDOT or by ATSSA; possess two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; possess two years of documented experience in conducting training courses; complete and possess the ATSSA Virginia Advanced Traffic Control Design Specialist (TCDS) certification or ATSSA Virginia Intermediate TCS certification.

To become an approved instructor, an application must be completed listing the above qualifications and sent to the chairman of VDOT's WZST committee at the following location:
http://www.virginiadot.org/business/resources/wztc/wztc_inst_app_form.pdf

Once a person has become an approved instructor, training material can be obtained from VDOT using the order form obtained from the following location (requires an approved instructor identification number):
http://www.virginiadot.org/business/resources/wztc/WZTC_order_form.pdf

OPTION 2 – Obtain the services of an approved instructor from VDOT's Approved WZTC Instructor List to teach the course or courses you need for your employees.

The Approved WZTC Instructor's List can be obtained at the following location:
http://www.virginiadot.org/business/resources/wztc/Approved_WZTC_Instructors.pdf

A list of Approved Providers of training can be obtained at the following location:
http://www.virginiadot.org/business/resources/wztc/wztc_training_sponsors.pdf

OPTION 3 – Send personnel to classes conducted by approved sources such as ATSSA Virginia or the Virginia Local Technical Assistance Program (LTAP).

Courses by ATSSA Virginia can be found at the following location:
http://atssa.com/cs/course_information/courses_by_state?state=56

Courses by the Virginia LTAP can be found at the following location:
http://ltap.cts.virginia.edu/2%20Page%20Calendar%20June%20-%20Sept%2009.pdf

Basic WZTC courses by the Virginia Rural Water Association can be found at the following location:
http://www.vrwa.org/ (See Training Schedule)

Training by the Virginia Transportation Construction Alliance (VTCA) can be found at the following location: http://vtca.org/

Visit the following site for additional information regarding Virginia's Work Zone Traffic Control training program:
http://www.virginiadot.org/business/trafficeng-WZS.asp

Authorized Hours and Days of Work

Normal hours for work under the authority of a VDOT land use permit are from 9:00 a.m. to 3:30 p.m. Monday through Friday for all highways classified as arterial or collector. All highways classified as local roads will have unrestricted work hours and days.
The district administrator's designee may establish alternate time restrictions in normal working hours for single use permits.

The central office permit manager may establish alternate time restrictions in normal working hours for district-wide permits.

The classifications for all state maintained highways can be found at the following link:
http://www.virginiadot.org/projects/fxn_class/maps.asp

Emergency Repair

In the event of an emergency situation that requires immediate action to protect persons or property, work may proceed within the right-of-way without authorization from the district administrator's designee; however, the utility owner must contact the VDOT Emergency Operations Center as soon as reasonably possible but no later than 48 hours after the end of the emergency situation.

The utility owner must apply for a separate land use permit from the local district permit office for any emergency work performed on state maintained right-of-way when the following actions are proposed:

- Stopping or impeding highway travel in excess of 15 minutes, or,
- Accessing facilities within limited access right-of-way, or,
- Cutting the highway pavement or shoulders.

The district administrator's designee shall determine the applicable permit fee for emergency repair permits.

Holiday Restrictions

Permitted non-emergency work will not be allowed on arterial and collector highway classifications from noon on the preceding weekday through the following state observed holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day. If the observed holiday falls on a Monday, the permit will not be valid from noon on the preceding Friday through noon on Tuesday.

Excavation

All excavation within state maintained rights-of-way shall comply with OSHA Technical Manual, Chapter 2, Title Excavation: Hazard Recognition in Trenching and Shoring. A professional engineer shall certify all shoring and/or trench boxes.

No excavated material is to be placed or tracked on the pavement without written permission from the District Administrator's designee. When so authorized, the pavement shall be satisfactorily cleaned by a VDOT approved method. No cleated (track-mounted) equipment is to be used on the pavement without properly protecting the pavement from damage.

Trenchless Construction

Site specific geotechnical sub-surface investigation reports, compiled in accordance with the provisions of VDOT Materials Division Manual of Instructions, shall be submitted to the district administrator's designee if the following trenchless installation(s) are proposed:

- The proposed pipe diameter is 24-inches or greater, and;
- The proposed pipe cover is less than 3 times the pipe diameter, and;
- The AADT of roadway is greater than 25,000, or;
- The proposed pipe diameter is 60-inches or greater, or;
- Any situation where there is a significant risk identified.

Inspection and Restoration

1) Inspection and testing of all backfill and pavement sections shall be performed in accordance with all applicable sections of VDOT's Road and Bridge Specifications (current edition).

2) If during or before construction it is deemed necessary for the local district permit office to assign an inspector to the project, the permittee shall pay the Department an additional inspection fee in an amount that will cover the salary, expense allowance, and mileage allowance for the inspection(s) assigned by the Department for handling work covered by this permit. Said inspection fee shall be paid promptly each month on invoices rendered by the Department.

3) It shall be the decision of the district administrator's designee whether to assign an inspector to monitor the placement of all backfill and pavement restoration activities.

4) The absence of a VDOT inspector does not in any way relieve the permittee of their responsibility to perform the work in accordance with the approved plans, provisions of the attached permit, VDOT's Road and Bridge Standards (current edition) and VDOT's Road and Bridge Specifications (current edition).

5) The permittee shall be responsible for any settlement of all backfill or pavement restoration necessitated by authorized excavation activities for a period of two (2) years after the completion date of permit, and for the continuing maintenance of the facilities placed

within the highway right-of-way. A one (1) year restoration warranty period may be considered, provided the permittee adheres to the following criteria:

- The permittee retains the services of a professional engineer (or certified technician under the direction of the professional engineer) to observe the placement of all backfill and pavement restoration.
- The professional engineer (or certified technician under the direction of the professional engineer) performs any required inspection and testing in accordance with all applicable sections of VDOT's Road and Bridge Specifications.
- The professional engineer submits all testing reports for review and approval, and provides written certification that all restoration procedures have been completed in accordance with all applicable sections of VDOT's Road and Bridge Specifications prior to completion of the work authorized by the permit.

6) Whenever existing pavement is permitted to be cut, not over one-half of the roadway width shall be disturbed at one time and the first open cut trench section shall be satisfactorily restored to allow for the passage of traffic prior to the second half of the roadway surface can be disturbed.

7) All crossing of existing pavement shall be bored, pushed or jacked an appropriate distance from the edge-of-pavement so as not to impede the normal flow of traffic or damage the existing pavement section. Existing pavement shall not be cut unless approved by the district administrator's designee and then only if justifiable circumstances prevail or proof is shown that a thorough attempt has been made to push, bore or jack.

8) Authorized daily trench excavation within pavement sections shall not exceed 500 feet in length.

9) Pavement restoration shall be in accordance with the VDOT LUP-OC Pavement Open Cut Special Provisions. This document can also be found at: http://www.virginiadot.org/business/bu-landUsePermits.asp

10) Where the pavement is disturbed or deemed weakened in its entirety or such portions as deemed desirable by the Department, the pavement shall be restored or replaced in a manner that is satisfactory to the district administrator's designee.

Environmental

1) In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification §107.16, all contractors performing regulated land disturbing activities within VDOT right-of-way must have at least one (1) employee that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training. This person shall be on site during all land disturbance activities and will be responsible for insuring compliance with all applicable local, state and federal erosion and sediment control regulations during land disturbance activities. This person must have their certification card with them while on the project site. The land use permit will be suspended if proof of certification cannot be provided. Regulated land disturbing activities are defined as those activities that disturb 2,500 square feet or greater in Tidewater, Virginia or 10,000 square feet or greater in all other areas of the State. The Department will require evidence of this certification with any land use permit application that involves utility and/or commercial right of way improvement. Improper installation, maintenance and removal of erosion and sediment control devices may result in revocation of VDOT Erosion & Sediment Control Contractor Certification.

2) The permittee is responsible for pursuing and obtaining any and all environmental permits which may be required to pursue the proposed activity prior to any work beginning within state maintained right-of-way.

3) In the event hazardous materials or underground storage tanks are encountered within state maintained right-of-way during authorized activities, the permittee shall suspend all work immediately then notify the local district permit office and other responsible parties, i.e., the local fire department, emergency services, Department of Environmental Quality, etc. The permittee is responsible for coordination and completion of all required remediation necessary to complete the permitted activities within the state maintained right-of-way. The permittee shall provide evidence of such compliance to the local district permit office prior to recommencement of permitted activities.

4) In the event cultural resources, archaeological, paleontological, and/or rare minerals are encountered within the right of way during authorized activities, the permittee shall suspend all work immediately then notify the local district permit office and the proper state authority charged with the responsibility for investigation and evaluation of such finds. The permittee will meet all necessary requirements for resolving any conflicts prior to continuing with the proposed activities within the state maintained right-of-way, and shall provide evidence of such compliance to the local district permit office.

5) Roadway drainage shall not be blocked or diverted. The shoulders, ditches, roadside, drainage facilities and pavement shall be kept in an operable condition satisfactory to the Department. Necessary precautions shall be taken by the permittee to insure against siltation of adjacent properties, streams, etc., in accordance with VDOT's current standards or as prescribed by the Department's Environmental Manual and the district administrator's designee.

Entrances

1) VDOT's authority to regulate highway entrances is provided in §, §33.2-240, and §33.2-241 of the Code of Virginia and its authority to make regulations concerning the use of highways generally is provided in §33.2-210 of the Code of Virginia. Regulations regarding entrances are set forth in VDOT's regulations promulgated pursuant to §33.2-245 of the Code of Virginia.

2) The permittee shall be responsible for the design and installation of a private entrance under the auspices of a VDOT land use permit however the permittee may request that VDOT forces install the private entrance at the permittee's expense.

3) Street connections, private entrances, and construction entrances shall be kept in satisfactory condition during all activities authorized under the auspices of a VDOT land use permit. Entrances shall not be blocked. Ample provisions must be made to provide safe ingress and egress to adjacent properties at all times. Entrances that are disturbed shall be restored to the satisfaction of the property owner and the district administrator's designee.

Utilities

1) Prior to any excavation, the permittee shall comply with the terms of Title 56, Chapter 10.3 of the Underground Utility Damage Prevention Act and §56-265.14 through §56-265.20 of the Code of Virginia. This permit does not grant permission to grade on or near property of others, or, adjust or disturb in anyway existing utility poles or underground facilities within the permitted area. Permission to do so must be obtained from the impacted utility company and any expense involved shall be borne by the permittee. Any conflicts with existing utility facilities must be resolved between the permittee and the utility owner(s) involved.

2) All underground utility installations within limited access right-of-way shall have a minimum of 36 inches of cover. All underground utilities within non-limited access right-of-way will require a minimum of 36 inches of cover, except underground cables that provide telecommunications service shall be at a minimum of 30 inches of cover.

3) Where feasible, all aboveground installations (such as fire hydrants, telephone pedestals, markers, etc.) shall be located adjacent to the outside edge of the right-of-way line and in accordance with minimum clear zone requirements. All manhole covers, valve box, etc., shall be installed two inches below existing ground line and shall conform to existing contours.

4) No poles, guys, anchors, etc., are to be placed on state maintained right-of-way unless authorized under the auspices of a VDOT land use permit. At no time will any such facilities be allowed between the ditch line and the traveled roadway.

5) All overhead installations crossing non-limited access highways shall provide a minimum of 18 feet of vertical clearance or at a minimum height as established by the National Electric Safety Code, whichever is greater. All overhead utility installations within limited access right-of-way shall maintain a minimum of 21 feet of vertical clearance. The vertical clearance for all new overhead parallel installations within non-limited access rights-of-way shall be in compliance with standards as specified in the National Electric Safety Code.

Final Inspection and Completion of Permit

Upon completion of the work covered by this permit all disturbed areas outside of the roadway prism shall be restored to their original condition as found prior to starting such work.

Completion of this permit is contingent upon the permittee's completion of the authorized work in accordance with the approved plan and compliance with all governing bodies involved in the total completion of work on state maintained right-of-way.

Upon completion of the work under permit, the permittee shall provide notification, documented in writing or electronic communication, to the district administrator's designee requesting final inspection. This request shall include the permit number, county name, route number and name of the party or parties to whom the permit was issued.

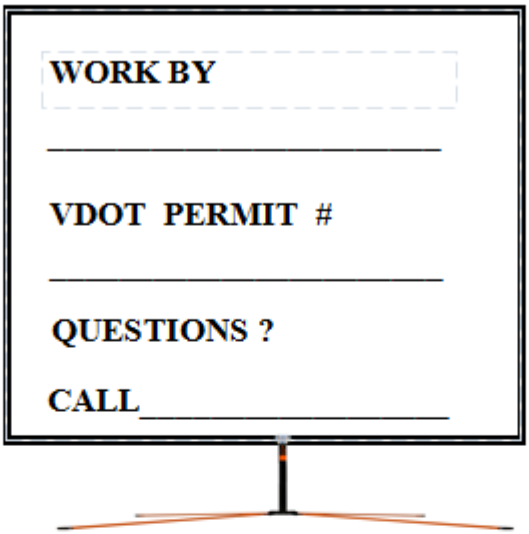
The district administrator's designee shall promptly schedule an inspection of the work covered under the permit and advise the permittee of any necessary corrections.

Permit Revocation

At the discretion of the district administrator's designee, a land use permit may be revoked upon written finding that the permittee was not in compliance with all requirements contained herein and/or violated the terms of the permit, or any state and local laws and ordinances regulating activities within the right-of-way. In addition VDOT may apply additional penalties in accordance with §33.2-1221.

Permittee Notice

The preceding provisions are intentionally condensed in format and should not be loosely interpreted by the permittee without consultation with the central office permit manager and affirmation from the Land Use Permit Regulations.



1. Sign must not be oriented facing traffic approaching from any direction
2. Sign must be non-reflective
3. Sign must use Times New Roman font and should not use MUTCD sign fonts (or Clearview)
4. Sign must not show any logos
5. Sign must not contain the contractor's name (unless the contractor is the permittee)
6. Sign must be installed outside clear zone within 50' of work area
7. Sign must remain on site until final restoration of right of way
8. For multiple work locations within subdivisions, at least one sign may be installed at the main work area
9. Sign must be at least 36"X36" and made of water-resistant material and firmly secured
10. Sign must be blue with white 3" lettering
11. Sign shall not be installed on existing VDOT sign posts and should not impede pedestrian mobility

August 1, 2016

Land Use Permit - LUP-UT
Utility installations

The installation of utilities on state maintained highway right-of-way is authorized under Sections **24VAC30-151-300** General Provisions Governing Utilities through 24VAC30-151-400 of the Land Use Permit Regulations
http://law.lis.virginia.gov/admincode/title24/agency30/chapter151/

Land Use Permit Required by Law

The General Rules and Regulations of the Commonwealth Transportation Board provide that no work of any nature shall be performed on any real property under the ownership, control, or jurisdiction of VDOT until written permission has been obtained from VDOT. Written permission is granted for the installation of private entrances on state maintained highway right-of-way through the issuance of a land use permit.

By issuing a permit, VDOT is giving permission only for whatever rights it has in the right-of-way; the permittee is responsible for obtaining permission from others who may also have an interest in the property.

The permittee will be civilly liable to the Commonwealth for expenses and damages incurred by VDOT as a result of violation of any of the rules and regulations of this chapter. Violators shall be guilty of a misdemeanor and, upon conviction, shall be punished as provided for in §**33.2-210** of the Code of Virginia.

Application Requirements

Application for a land use permit authorizing the installation of utilities on non-limited or limited access state maintained highways shall be made through the local district permit office where the activity is to take place.

The proposed installation shall accompany plan/sketches showing distances from edge of pavement, existing and proposed right-of-way line, depths below existing and proposed grades, depths below ditch line or underground drainage structures, or other features shall be shown. Any existing utilities within close proximity of the permittee's work shall be shown. Location of poles, guys, pedestals, relief valves, vent pipes, etc. shall be shown. Height of wires or cables above the crown of the roadway shall be shown.

Please note the company has to be registered with the State Corporation Commission and with Miss Utility.

Application, forms and general information regarding VDOT land use permitting for the installation of utility on state maintained highways right-of-way are included below.

24VAC30-151-710. Fees.

A. Single use permit. A nonrefundable application fee shall be charged to offset the cost of reviewing and processing the permit application and inspecting the project work, in accordance with the requirements below:

1. The application fee for a single permit is $100.
2. Additive costs shall be applied as indicated below.

Activity	Fee
Storm Sewer	$10 per 100 linear feet
Box Culvert or Bridge	$5 per linear foot of attachment
Drop Inlet	$10 per inlet
Pole Attachment	$10 per structure
Span Guy	$10 per crossing
Additive Guy and Anchor	$10 per guy and anchor
Underground Utility - Parallel	$10 per 100 linear feet

Activity	Fee
Overhead or Underground Crossing	$10 per crossing
Excavation Charge (including Test Bores and Emergency Opening)	$10 per opening

Surety Requirement

The permittee and/or their agent shall provide surety to guarantee the satisfactory performance of the activity authorized under the auspices of the land use permit issued for the initial installation. The surety shall be based on the estimated cost of work to be performed within the right-of-way and the amount shall be determined by the district administrator's designee. The surety may be in the form of a check, cash, irrevocable letter of credit, Corporate Surety, Resolution or bond. This surety will be refunded or released upon satisfactory completion of the initial installation and inspection by VDOT.

Cash Surety Refund

Applicants owing the Internal Revenue Service or the Commonwealth of Virginia may not receive a refund of the cash guarantee provided for the issuance of a VDOT land use permit unless the amount owed is less than the amount of cash guarantee provided. Applicants providing cash guarantee for the issuance of a VDOT land use permit must provide an executed copy of the Commonwealth of Virginia's Substitute Form W-9 to receive a refund of the cash guarantee provided for the issuance of a VDOT land use permit

Contact Information

A list of counties with their corresponding VDOT district offices and contact information may be obtained at the following VDOT web site: **http://www.virginiadot.org/about/districts.asp**

Land Use Permit Application (LUP-A)

APPLICATION is hereby made for permit as shown on the accompanying plan or sketch and as described below. Said activity(s) will be done under and in accordance with the rules and regulations of the Commonwealth Transportation Board of Virginia, in so far as said rules are applicable thereto and any agreement between the parties herein before referred to. Where applicable agreements may be attached and made a part of the permit assembly including any cost responsibilities covering work under permit. Applicant agrees to maintain work in a manner as approved upon its completion. Applicant also hereby agrees and is bound and held responsible to the owner for any and all damages to any other installations already in place as a result of work covered by resulting permit. Applicants to whom permits are issued shall at all times indemnify and save harmless the Commonwealth Transportation Board members of the Board, the Commonwealth and all Commonwealth employees, agents, and offices, from responsibility, damage, or liability arising from the exercise of the privileges granted in such permit to the extent allowed by law. In consideration of the issuance of a permit the applicant agrees to waive for itself, successors in interest or assigns any entitlements it may otherwise have or have hereafter under the Uniform Relocation and Assistant Act of 1972 as amended in event the Department or its successor, chooses to exercise its acknowledged right to demand or cause the removal of any or all fixtures, personality of whatever kind or description that may hereafter be located, should this application be approved.

Applicant information:

Driver's License or Tax ID No. _____ Contact Name _____

Owner Name _____ E-mail Address _____

Address _____ Telephone Number _____

City _____State _____Zip Code_____ Emergency Telephone Number _____

Fax Number _____

Agent information:

Driver's License or Tax ID No. _____ Contact Name _____

Owner Name _____ E-mail Address _____

Address _____ Telephone Number _____

City _____State _____Zip Code_____ Emergency Telephone Number _____

Fax Number _____

Permit Term Requested _____ Fees Enclosed $ _____ Check Number _____ Money Order _____

Estimated cost of work to be performed on VDOT Right of Way $_____

Surety Information:

Surety Posted by: ☐ Owner ☐ Agent ☐ County Resolution ☐ Waived

If cash/check surety is posted, please complete Commonwealth of Virginia's Substitute Form W-9.

Bonding Company Name _____ Bond # _____

Irrevocable Letter of Credit - Bank Name _____ Irrevocable Letter of Credit # _____

Surety paid by Check - Check Number _____

Amount of Surety $ _____ Obligation Amount $_____

Request permission to perform the following activity(s): _____

_____

_____

_____as per attached plans.

Location: ☐ County ☐ Town ☐ City of _____ Route No. _____ Street Name _____

Between Route No. _____ Street Name _____ and Route No._____ Street Name _____

Latitude _____ Longitude_____ Tax Map Number _____ Applicant Job No._____

Applicant shall provide proof of registration as an operator with the appropriate notification center in accordance as defined in §2.2-1151.1 of the Code of Virginia & must provide a notarized affidavit, stating that the utility owner has notified the commercial and residential developer, owner of commercial or multifamily real estate, or local government entities with a property interest in any parcel of land located adjacent to the property over which the land use is being requested, that application for the permit has been made.

☐ IF APPLICABLE, I AGREE TO PAY THE FULL SALARY AND EXPENSES OF A STATE ASSIGNED INSPECTOR IN CONJUNCTION WITH ACTIVITIES AUTHORIZED UNDER THE AUSPICES OF A VDOT LAND USE PERMIT.

By signing below, I acknowledge that I am fully cognizant of all the LUP-SPG requirements associated with the issuance of a VDOT Land Use Permit.

Signature of Applicant: _____ Title _____ Date _____

Signature of Agent: _____ Title _____ Date _____

All applicable items on this form must be completed to avoid delay in processing the issuance of a VDOT Land Use Permit.
Prepayment required with remittance payable to Virginia Department of Transportation.

VDOT USE ONLY

Receipt is hereby acknowledged for: CHECK No.: _____ MONEY ORDER No.: _____

In the Amount of $ _____ for PERMIT FEE $ _____ CASH SURETY $ _____

Authorized VDOT Signature: _____ Date: _____

*Agent mean: Applicant contractor's or a person or business authorized to act on another's behalf.

Land Use Permit
LUP-SPG
Special Provisions General
Permittee Agreement for Land Use Permit Issuance

Any of the following provisions that may apply, shall apply:

General Requirements

1) Permittee acceptance and use of a Virginia Department of Transportation (VDOT) land use permit is prima facie evidence that the permittee has read and is fully cognizant of all required permit provisions, applicable traffic control plans and associated construction standards to be employed. All applicants to whom permits are issued shall at all times indemnify and save harmless the Commonwealth Transportation Board, members of the Board, the Commonwealth, and all Commonwealth employees, agents, and officers, from responsibility, damage, or liability arising from the exercise of the privileges granted in such permit to the extent allowed by law including any sums ordered to be paid or expended by VDOT by any governmental entity as a fine, penalty or damages for any violation of any applicable environmental law, or to remediate any hazardous or other material, including illicit discharge into VDOT maintained storm sewer systems.

2) The permittee assumes full responsibility for any and all (downstream flooding, erosion, siltation, etc.) damages that may occur as a result of the work performed under this permit. Furthermore, the Department will in no way be responsible for any damage to the facility being placed as a result of future maintenance or construction activities performed by the Department.

3) The permittee agrees to move, remove, alter, or change any installation that interferes with the ultimate construction of the highway in alignment or grade at no cost to the Department unless otherwise stipulated and agreed to by the Department.

4) The permittee shall immediately correct any situation that may arise as a result of these activities that the district administrator's designee deems hazardous to the traveling public.

5) Any and all highway signs, right-of-way markers, etc., disturbed as a result of work performed under the auspices of a land use permit shall be accurately reset by the permittee immediately following the work in the vicinity of the disturbed facility. The services of a certified land surveyor with experience in route surveying may be required.

6) It shall be the permittee's responsibility to obtain any and all necessary permits that may be required by any other government agencies, i.e., U.S. Army Corp. of Engineers, Department of Environmental Quality, Department of Conservation and Recreation, etc.

7) A copy of the VDOT land use permit shall be maintained at the work site and made readily available for inspection when requested by authorized VDOT personnel.

8) The permittee shall notify the local district permit office at least 48 hours prior to commencement of any work requiring inspection and/or testing as stipulated in VDOT's Road and Bridge Standards (current edition) and VDOT's Road and Bridge Specifications (current edition). Failure to carry out this requirement may result in permit revocation.

9) The permittee or their agent must contact the VDOT Customer Service Center at 1-800-367-7623 a minimum of 48 hours prior to initiating any planned excavation within 1,000 feet of a signalized intersection and/or near VDOT ITS infrastructure. Excavation activities may proceed only after the VDOT regional utility location agent has notified the permittee that the utility marking has been completed. Additional information can be found at:
http://www.virginiadot.org/business/resources/IIM/TE-383_Request_for_Marking_VDOT_Utility_Location.pdf

Alternately, within all localities in the Northern Virginia Construction District, including the Counties of Arlington, Fairfax, Loudoun & Prince William, the Cities of Alexandria, Fairfax, Falls Church, Manassas and Manassas Park, and the Towns of Clifton, Dumfries, Hamilton, Haymarket, Herndon, Hillsboro, Leesburg, Lovettsville, Middleburg, Occoquan, Purcellville, Quantico, Round Hill and Vienna, and on Interstate 95 in the counties of Stafford, Spotsylvania and Caroline, the permittee may request VDOT regional utility marking at: **http://www.vdotutilitymarking.virginia.gov**

Failure to carry out this requirement may result in permit revocation.

10) The permittee shall to notify "Miss Utility" (or each operator of an underground utility where no notification center exists) of any planned excavation within state maintained right-of-way. This notification must be provided at least 48 hours (excluding weekends and holidays) in advance of commencing with any planned excavation within state maintained right-of-way. Failure to carry out this requirement may result in permit revocation.

11) It is the duty of the district administrator's designee to keep all roads maintained in a safe and travelable condition at all times. Therefore, any permit may be denied, revoked or suspended when in the opinion of the district administrator's designee, the safety, use or maintenance of the highway so requires.

12) The permittee shall at all times give strict attention to the safety and rights of the traveling public, their employees and themselves. VDOT reserves the right to stop work at any time due to safety problems and/or non-compliance with the terms of the permit. The Department may, at its discretion, complete any of the work covered in the permit or restore the right-of-way to the department's standards and invoice the permittee for the actual cost of such work. The permittee may be required to move, alter, change or remove from state maintained right-of-way, in a satisfactory manner, any installation made under this permit.

13) All work authorized under the auspices of a VDOT land use permit shall be subject to VDOT's direction and be in accordance with VDOT's Road and Bridge Standards (current edition) and VDOT's Road and Bridge Specifications (current edition).

14) Design changes, specified material changes and/or field changes from the approved plans shall be submitted to the appropriate district administrator's designee for review and approval prior to proceeding with the proposed changes. This submittal shall include written justification, supplemental documentation and/or engineering calculations that support the requested changes.

15) The permittee shall meet or exceed the existing pavement design and typical section when constructing pavement widening adjacent to an existing state maintained roadway. The proposed pavement design and typical section shall be approved by the district administrator's designee prior to commencing with any work within state maintained right-of-way. All pavement widening shall be in accordance with VDOT's Road and Bridge Standard 303.02.

16) Within the limits of a VDOT construction project it is the responsibility of the permit applicant to obtain the contractor's consent in writing prior to permit issuance. Information regarding current and/or planned VDOT construction and maintenance activities can be obtained at: **http://www.virginiaroads.org/**.

Insurance Requirements (excluding County, Town or City)

The permittee or their agent shall secure and maintain insurance to protect against liability for personal injury and property damage that may arise from the activities performed under the authority of a land use permit and from the operation of the permitted activity up to one million dollars ($ 1,000,000) each occurrence to protect the Board members and the Department's agents or employees; seventy-five thousand dollars ($75,000) each occurrence to protect the Board, the Department, or the Commonwealth in event of suit. Insurance must be obtained prior to start of the permitted work and shall remain valid through the permit completion date. VDOT staff may require a valid certificate or letter of insurance from the issuing insurance agent or agency prior to issuing the land use permit.

Traffic Control and Safety

1) The permittee shall at all times give strict attention to the safety and rights of the traveling public, their employees, and contractors. Any permit may be revoked or suspended when in the opinion of the district administrator's designee, the safety, use or maintenance of the highway so requires.

2) In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification, Special Provision 105.14, all activities performed under the auspices of a VDOT Land Use Permit involving the installation, maintenance and removal of work zone traffic control devices must have an individual on-site who, at a minimum, is accredited by VDOT in Basic Work Zone Traffic Control. The accredited person must have their VDOT Work Zone Traffic Control accreditation card in their possession while on-site.

3) The individual accredited in Basic Work Zone Traffic Control is responsible for the placement, maintenance and removal of work zone traffic control devices within the project limits in compliance with the permit requirements and conditions, the approved plans and specifications, the Virginia Work Area Protection Manual, and the Manual of Uniform Traffic Control Devices.

4) A person accredited by VDOT in Intermediate Work Zone Traffic Control must be on-site to provide supervision for adjustment to the approved layout of any standard Typical Traffic Control (TTC) layouts outlined in the Virginia Work Area Protection Manual.

5) All traffic control plans shall be prepared by a person verified by VDOT in Advanced Work Zone Traffic Control.

6) Individuals responsible for implementation of work zone traffic control measures shall provide evidence of their accreditation upon request from VDOT personnel.

7) The permittee shall be exempt from the requirements of Virginia Department of Transportation (VDOT) Road and Bridge Specification, Special Provision 105.14 if the authorized activity is not within the roadway (as defined in 24VAC30-151) of a state maintained highway.

8) Non-compliance with the requirements outlined in VDOT Road and Bridge Specification, Special Provision 105.14 may result in a stop work order and / or permit revocation.

9) All activities that require the disruption (stoppage) of traffic shall utilize VDOT certified flaggers. Flag persons shall be provided in sufficient number and locations as necessary for control and protection of vehicular and pedestrian traffic in accordance with the Virginia Work Area Protection Manual. All flaggers must have their certification card in their possession when performing flagging operations within state maintained right-of-way. Any flag person found not in possession of his/her certification card shall be removed from the flagging site and the district administrator's designee will suspend all permitted activities.

10) Any VDOT certified flag person found to be performing their duties improperly shall have their certification revoked.

11) All signs shall be in accordance with the current edition of the Manual of Uniform Traffic Control Devices (MUTCD).

12) The permittee shall immediately correct any situation that may arise as a result of these activities that the district administrator's designee deems hazardous to the traveling public.

13) During authorized activities, the permittee shall furnish all necessary signs, flag persons and other devices to provide for the protection of traffic and workers in accordance with the Virginia Work Area Protection Manual or as directed by the district administrator's designee.

14) Traffic shall not be blocked or detoured without permission, documented in writing or electronic communication, being granted by the district administrator's designee.

15) All lane or shoulder closures on highways in the Northern Virginia construction district classified as arterial or collector routes must be authorized, documented in writing or by electronic communication by the VDOT Transportation Operations Center (NRO/TOC).

16) The permittee shall notify the following appropriate VDOT Transportation Operations Center (TOC) 30 minutes prior to the installation of a lane closure or shoulder closure on non-limited access primary routes and within 30 minutes of removing the lane or shoulder closure:

- Eastern Region (757) 424-9920: All localities within the Hampton Roads construction district excluding Greenville County and Sussex County
- Northern Virginia (703) 877-3401: All localities within the NOVA construction district including Spotsylvania County and Stafford County
- Central Region (804) 796-4520: All localities within the Richmond construction district including Greenville County and Sussex County. All localities within the Fredericksburg district excluding Spotsylvania County and Stafford County
- SW Region (540) 375-0170: All localities within the Salem, Bristol, and Lynchburg construction districts
- NW Region (540) 332-9500: All localities within the Staunton and Culpeper construction districts

VIRGINIA WORK ZONE TRAFFIC CONTROL TRAINING OPTIONS

The following three options are available to receive Work Zone Traffic Control (WZTC) training based on an individual's job duties and responsibilities as required by the FHWA Final Rule on Work Zone Safety and Mobility and the Virginia Department of Transportation:

OPTION 1 – Have someone trained to become a qualified instructor in your company who can then instruct others , utilizing training material provided by VDOT. The following qualifications must be met in order to teach the VDOT Basic, Intermediate, or Advanced WZTC training courses:

- **Basic** – Be flagger certified either by VDOT or by the American Traffic Safety Services Association (ATSSA); possess two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; possess two years of documented experience in conducting training courses; and successfully complete the VDOT WZTC Intermediate or Advanced course or complete the ATSSA Virginia Intermediate/Traffic Control Supervisor (TCS) course.

- **Intermediate** - Be flagger certified either by VDOT or by ATSSA; possess two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; possess two years of documented experience in conducting training courses; complete and possess the ATSSA Virginia Intermediate/TCS certification.

- **Advanced** - Be flagger certified either by VDOT or by ATSSA; possess two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; possess two years of documented experience in conducting training courses; complete and possess the ATSSA Virginia Advanced Traffic Control Design Specialist (TCDS) certification or ATSSA Virginia Intermediate TCS certification.

To become an approved instructor, an application must be completed listing the above qualifications and sent to the chairman of VDOT's WZST committee at the following location:
http://www.virginiadot.org/business/resources/wztc/wztc_inst_app_form.pdf

Once a person has become an approved instructor, training material can be obtained from VDOT using the order form obtained from the following location (requires an approved instructor identification number):
http://www.virginiadot.org/business/resources/wztc/WZTC_order_form.pdf

OPTION 2 – Obtain the services of an approved instructor from VDOT's Approved WZTC Instructor List to teach the course or courses you need for your employees.

The Approved WZTC Instructor's List can be obtained at the following location:
http://www.virginiadot.org/business/resources/wztc/Approved_WZTC_Instructors.pdf

A list of Approved Providers of training can be obtained at the following location:
http://www.virginiadot.org/business/resources/wztc/wztc_training_sponsors.pdf

OPTION 3 – Send personnel to classes conducted by approved sources such as ATSSA Virginia or the Virginia Local Technical Assistance Program (LTAP).

Courses by ATSSA Virginia can be found at the following location:
http://atssa.com/cs/course_information/courses_by_state?state=56

Courses by the Virginia LTAP can be found at the following location:
http://ltap.cts.virginia.edu/2%20Page%20Calendar%20June%20-%20Sept%2009.pdf

Basic WZTC courses by the Virginia Rural Water Association can be found at the following location:
http://www.vrwa.org/ (See Training Schedule)

Training by the Virginia Transportation Construction Alliance (VTCA) can be found at the following location: **http://vtca.org/**

Visit the following site for additional information regarding Virginia's Work Zone Traffic Control training program:
http://www.virginiadot.org/business/trafficeng-WZS.asp

Authorized Hours and Days of Work

Normal hours for work under the authority of a VDOT land use permit are from 9:00 a.m. to 3:30 p.m. for all highways classified as arterial or collector. All highways classified as local roads will have unrestricted work hours and days.

The district administrator's designee may establish alternate time restrictions in normal working hours for single use permits.

The central office permit manager may establish alternate time restrictions in normal working hours for district-wide permits.

The classifications for all state maintained highways can be found at the following link:
http://www.virginiadot.org/projects/fxn_class/maps.asp

Emergency Repair

In the event of an emergency situation that requires immediate action to protect persons or property, work may proceed within the right-of-way without authorization from the district administrator's designee; however, the utility owner must contact the VDOT Emergency Operations Center as soon as reasonably possible but no later than 48 hours after the end of the emergency situation.

The utility owner must apply for a separate land use permit from the local district permit office for any emergency work performed on state maintained right-of-way when the following actions are proposed:

- Stopping or impeding highway travel in excess of 15 minutes, or,
- Accessing facilities within limited access right-of-way, or,
- Cutting the highway pavement or shoulders.

The district administrator's designee shall determine the applicable permit fee for emergency repair permits.

Holiday Restrictions

Permitted non-emergency work will not be allowed on arterial and collector highway classifications from noon on the preceding weekday through the following state observed holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day. If the observed holiday falls on a Monday, the permit will not be valid from noon on the preceding Friday through noon on Tuesday.

Excavation

All excavation within state maintained rights-of-way shall comply with OSHA Technical Manual, Chapter 2, Title Excavation: Hazard Recognition in Trenching and Shoring. A professional engineer shall certify all shoring and/or trench boxes.

No excavated material is to be placed or tracked on the pavement without written permission from the District Administrator's designee. When so authorized, the pavement shall be satisfactorily cleaned by a VDOT approved method. No cleated (track-mounted) equipment is to be used on the pavement without properly protecting the pavement from damage.

Inspection and Restoration

1) Inspection and testing of all backfill and pavement sections shall be performed in accordance with all applicable sections of VDOT's Road and Bridge Specifications (current edition).

2) If during or before construction it is deemed necessary for the local district permit office to assign an inspector to the project, the permittee shall pay the Department an additional inspection fee in an amount that will cover the salary, expense allowance, and mileage allowance for the inspection(s) assigned by the Department for handling work covered by this permit. Said inspection fee shall be paid promptly each month on invoices rendered by the Department.

3) It shall be the decision of the district administrator's designee whether to assign an inspector to monitor the placement of all backfill and pavement restoration activities.

4) The absence of a VDOT inspector does not in any way relieve the permittee of their responsibility to perform the work in accordance with the approved plans, provisions of the attached permit, VDOT's Road and Bridge Standards (current edition) and VDOT's Road and Bridge Specifications (current edition).

5) The permittee shall be responsible for any settlement of all backfill or pavement restoration necessitated by authorized excavation activities for a period of two (2) years after the completion date of permit, and for the continuing maintenance of the facilities placed within the highway right-of-way. A one (1) year restoration warranty period may be considered, provided the permittee adheres to the following criteria:

- The permittee retains the services of a professional engineer (or certified technician under the direction of the professional engineer) to observe the placement of all backfill and pavement restoration.
- The professional engineer (or certified technician under the direction of the professional engineer) performs any required inspection and testing in accordance with all applicable sections of VDOT's Road and Bridge Specifications.
- The professional engineer submits all testing reports for review and approval, and provides written certification that all restoration procedures have been completed in accordance with all applicable sections of VDOT's Road and Bridge Specifications prior to completion of the work authorized by the permit.

6) Whenever existing pavement is permitted to be cut, not over one-half of the roadway width shall be disturbed at one time and the first open cut trench section shall be satisfactorily restored to allow for the passage of traffic prior to the second half of the roadway surface can be disturbed.

7) All crossing of existing pavement shall be bored, pushed or jacked an appropriate distance from the edge-of-pavement so as not to impede the normal flow of traffic or damage the existing pavement section. Existing pavement shall not be cut unless approved by the district administrator's designee and then only if justifiable circumstances prevail or proof is shown that a thorough attempt has been made to push, bore or jack.

8) Authorized daily trench excavation within pavement sections shall not exceed 500 feet in length.

9) Pavement restoration shall be in accordance with the attached VDOT LUP-OC Pavement Open Cut Special Provisions.

10) Where the pavement is disturbed or deemed weakened in its entirety or such portions as deemed desirable by the Department, the pavement shall be restored or replaced in a manner that is satisfactory to the district administrator's designee.

Environmental

1) In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification §**107.16**, all contractors performing regulated land disturbing activities within VDOT right-of-way must have at least one (1) employee that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training. This person shall be on site during all land disturbance activities and will be responsible for insuring compliance with all applicable local, state and federal erosion and sediment control regulations during land disturbance activities. This person must have their certification card with them while on the project site. The land use permit will be suspended if proof of certification cannot be provided. Regulated land disturbing activities are defined as those activities that disturb 2,500 square feet or greater in Tidewater, Virginia or 10,000 square feet or greater in all other areas of the State. The Department will require evidence of this certification with any land use permit application that involves utility and/or commercial right of way improvement. Improper installation, maintenance and removal of erosion and sediment control devices may result in revocation of VDOT Erosion & Sediment Control Contractor Certification.

2) The permittee is responsible for pursuing and obtaining any and all environmental permits which may be required to pursue the proposed activity prior to any work beginning within state maintained right-of-way.

3) In the event hazardous materials or underground storage tanks are encountered within state maintained right-of-way during authorized activities, the permittee shall suspend all work immediately then notify the local district permit office and other responsible parties, i.e., the local fire department, emergency services, Department of Environmental Quality, etc. The permittee is responsible for coordination and completion of all required remediation necessary to complete the permitted activities within the state maintained right-of-way. The permittee shall provide evidence of such compliance to the local district permit office prior to recommencement of permitted activities.

4) In the event cultural resources, archaeological, paleontological, and/or rare minerals are encountered within the right of way during authorized activities, the permittee shall suspend all work immediately then notify the local district permit office and the proper state authority charged with the responsibility for investigation and evaluation of such finds. The permittee will meet all necessary requirements for resolving any conflicts prior to continuing with the proposed activities within the state maintained right-of-way, and shall provide evidence of such compliance to the local district permit office.

5) Roadway drainage shall not be blocked or diverted. The shoulders, ditches, roadside, drainage facilities and pavement shall be kept in an operable condition satisfactory to the Department. Necessary precautions shall be taken by the permittee to insure against siltation of adjacent properties, streams, etc., in accordance with VDOT's current standards or as prescribed by the Department's Environmental Manual and the district administrator's designee.

Entrances

1. Plans for the proposed installation of entrance(s) to state maintained highway right-of-way shall be designed in accordance with the current edition of VDOT's Road and Bridge Standards, VDOT's Road and Bridge Specifications and per VDOT *Road Design Manual*, Appendix F located at **http://www.extranet.vdot.state.va.us/locdes/Electronic_Pubs/2005%20RDM/AppendF.pdf.**

2. VDOT's authority to regulate highway entrances is provided in §, §**33.2-240**, and §**33.2-241** of the Code of Virginia and its authority to make regulations concerning the use of highways generally is provided in §**33.2-210** of the Code of Virginia. Regulations regarding entrances are set forth in VDOT's regulations promulgated pursuant to §**33.2-245** of the Code of Virginia.

3. The permittee shall be responsible for the design and installation of a private entrance under the auspices of a VDOT land use permit however the permittee may request that VDOT forces install the private entrance at the permittee's expense.

4. Street connections, private entrances, and construction entrances shall be kept in satisfactory condition during all activities authorized under the auspices of a VDOT land use permit. Entrances shall not be blocked. Ample provisions must be made to provide safe ingress and egress to adjacent properties at all times. Entrances that are disturbed shall be restored to the satisfaction of the property owner and the district administrator's designee.

Utilities

1) Prior to any excavation, the permittee shall comply with the terms of **Title 56, Chapter 10.3** of the Underground Utility Damage Prevention Act and §**56-265.14** through §**56-265.20** of the Code of Virginia. This permit does not grant permission to grade on or near property of others, or, adjust or disturb in anyway existing utility poles or underground facilities within the permitted area. Permission to do so must be obtained from the impacted utility company and any expense involved shall be borne by the permittee. Any conflicts with existing utility facilities must be resolved between the permittee and the utility owner(s) involved.

2) All underground utility installations within limited access right-of-way shall have a minimum of 36 inches of cover. All underground utilities within non-limited access right-of-way will require a minimum of 36 inches of cover, except underground cables that provide telecommunications service shall be at a minimum of 30 inches of cover.

3) Where feasible, all aboveground installations (such as fire hydrants, telephone pedestals, markers, etc.) shall be located adjacent to the outside edge of the right-of-way line and in accordance with minimum clear zone requirements. All manhole covers, valve box, etc., shall be installed two inches below existing ground line and shall conform to existing contours.

4) No poles, guys, anchors, etc., are to be placed on state maintained right-of-way unless authorized under the auspices of a VDOT land use permit. At no time will any such facilities be allowed between the ditch line and the traveled roadway.

5) All overhead installations crossing non-limited access highways shall provide a minimum of 18 feet of vertical clearance or at a minimum height as established by the National Electric Safety Code, whichever is greater. All overhead utility installations within limited access right-of-way shall maintain a minimum of 21 feet of vertical clearance. The vertical clearance for all new overhead parallel installations within non-limited access rights-of-way shall be in compliance with standards as specified in the National Electric Safety Code.

Final Inspection and Completion of Permit

Upon completion of the work covered by this permit all disturbed areas outside of the roadway prism shall be restored to their original condition as found prior to starting such work.

Completion of this permit is contingent upon the permittee's completion of the authorized work in accordance with the approved plan and compliance with all governing bodies involved in the total completion of work on state maintained right-of-way.

Upon completion of the work under permit, the permittee shall provide notification, documented in writing or electronic communication, to the district administrator's designee requesting final inspection. This request shall include the permit number, county name, route number and name of the party or parties to whom the permit was issued.

The district administrator's designee shall promptly schedule an inspection of the work covered under the permit and advise the permittee of any necessary corrections.

Permit Revocation

At the discretion of the district administrator's designee, a land use permit may be revoked upon written finding that the permittee was not in compliance with all requirements contained herein and/or violated the terms of the permit, or any state and local laws and ordinances regulating activities within the right-of-way.

The district administrator's designee shall promptly schedule an inspection of the work covered under the permit and advise the permittee of any necessary corrections

Permittee Notice

The preceding provisions are intentionally condensed in format and should not be loosely interpreted by the permittee without consultation with the central office permit manager and affirmation from the **Land Use Permit Regulations**.

LAND USE PERMIT
LUP-OC
Open-Cut Pavement Restoration Requirements

Any of the following provisions that may apply, shall apply:

1. The permittee shall be responsible for the restoration of pavement on state maintained highways in accordance with all applicable sections of the VDOT Road and Bridge Specifications, VDOT Road and Bridge Standards and this document.

2. Whenever existing pavement is permitted to be cut, not over one-half of the roadway width shall be disturbed at one time and the first open cut trench section shall be satisfactorily restored to allow for the passage of traffic prior to the second half of the roadway surface can be disturbed.

3. All trench backfill material shall be Select Material Type I having a minimum CBR of 30 and free from any wood, decaying material, asphalt, concrete, ice, frost, large clods, stone or debris.

4. Trench backfill material shall be compacted to a minimum of 95% of the theoretical maximum density at optimum moisture content, as determine by VDOT testing procedures (VTM1), using mechanical tamping throughout the depth of the trench in 6-inch lifts to ensure that the adequate support is provided for the aggregate sub-base layer is adequately supported.

5. For roadways with a bituminous concrete asphalt pavement section the compacted trench backfill shall be capped with 10 inches (10”) of Type I, Size 21-A or 21-B aggregate compacted to 100% of the theoretical maximum density at optimum moisture content covering the entire trench width and a minimum six inch (6”) bench on each side of the excavated trench or as determined by the district administrator’s designee.

6. A bituminous concrete asphalt base course (BM-25) having a minimum thickness of six inches (6”), or matching the existing base course thickness, shall be placed over the benched aggregate sub-base to the bottom elevation of the existing asphalt concrete surface course.

7. All sides of the excavated trench shall be saw-cut trimmed to neat straight lines and a tack coat of RC-250 liquid asphalt applied at a rate of 0.1 gallon per square yard (or as determined by the district administrator’s designee) prior to placing the bituminous concrete asphalt base course (BM-25.0) and/or replacement of the bituminous concrete asphalt surface course (SM-9.5A or SM-9.5D).

8. The existing pavement surface course adjacent to the excavated trench shall be milled and repaved with bituminous concrete asphalt (SM-9.5A or SM-9.5D) having of a minimum thickness of 1-1/2 inches (1.5”). This operation shall cover the entire trench width and extend 12 inches (12”) beyond the edge of the trench on longitudinal open cuts and 25 feet (25’) beyond the trench centerline on perpendicular open cuts, or as determined by the district administrator’s designee.

9. Open cuts in surface treated roadway sections with an aggregate base course shall be replaced with the same layer(s) as roadway sections with a bituminous concrete asphalt pavement structure except the sub-base layer (Type I, Size 21-A or 21-B) may be reduced to six inches (6”) and the bituminous concrete asphalt base layer (BM-25.0) may be reduced to four inches (4”) while maintaining the required six inch (6”) bench on both sides of the excavated trench. The surface course restoration material and thickness shall match the existing surface.

10. Replacement of all bituminous concrete asphalt and surface treated courses shall be rolled with equipment having a manufacturer’s rating of ten (10) tons until the aggregate is keyed into the bitumen. Where rolling is not possible, a mechanical tamper shall be utilized.

11. Full depth aggregate stone may be placed in the trench daily up to maximum length of 500 feet, at which time either temporary or permanent pavement restoration procedures must be implemented.

12. Should the application of the bituminous concrete asphalt surface course be delayed due to adverse weather conditions, the contractor shall provide and maintain a temporary pavement section that is acceptable to the district administrator's designee until such time as the appropriate permanent pavement restoration can be achieved.

13. The permittee shall be responsible for any settlement in the backfill or pavement for a period of two (2) years after the completion date of permit and for the continuing maintenance of the facilities placed within the highway right-of-way.

14. A one-year restoration warranty period may be considered, provided the permittee adheres to the following criteria:

    - The permittee retains the services of a professional engineer (or certified technician under the direction of the professional engineer) to observe the placement of all fill embankments, pavement, and storm sewer and utility trench backfill.
    - The professional engineer (or certified technician under the direction of the professional engineer) performs any required inspection and testing in accordance with all applicable sections of VDOT's Road and Bridge Specifications.
    - The professional engineer submits all testing reports for review and approval, and provides written certification that all restoration procedures have been completed in accordance with all applicable sections of VDOT's Road and Bridge Specifications prior to completion of the work authorized by the permit.

15. The district administrator's designee may request and review the backfill compaction test results and/or authorize an inspector to monitor the trench backfill and compaction operations.

16. The use of steel plates to provide a temporary riding surface will not be allowed between November 1 and April 1. The use of steel plates between April 2 and October 31 shall be in accordance with VDOT standards and specifications.

17. Traffic shall be maintained at all times in accordance with the Virginia Work Area Protection Manual and a VDOT approved Maintenance of Traffic (MOT) plan.

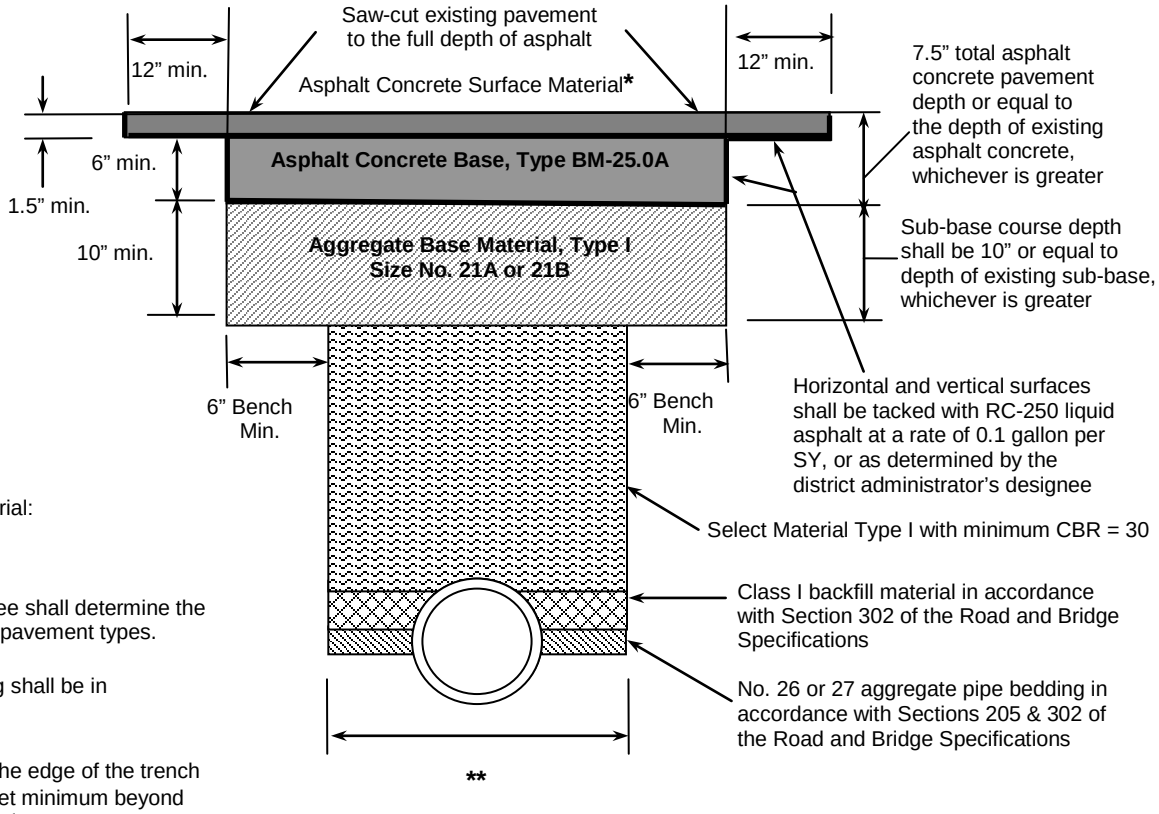
18. The permittee shall notify the district administrator's designee a minimum of 72 hours prior to initiating any pavement open cutting operations.

19. The trench to be backfilled shall be made as dry as practicable at the time of backfilling by pumping, bailing, draining, or other approved dewatering method.

20. All asphalt pavement restoration activities shall be in accordance with the Asphalt Pavement Restoration Detail for Open Cut Utility Installations contained herein.

LAND USE PERMIT
LUP-OC
Open-Cut Pavement Restoration Requirements

Asphalt Pavement Restoration Detail for Open Cut Utility Installations



NOTES:

* Asphalt Concrete Surface Material:
SM-9.5A for ADT < 10,000
SM-9.5D for ADT > 10,000

The district administrator's designee shall determine the restoration requirements for other pavement types.

** Trench width and pipe bedding shall be in accordance with VDOT Std. PB-1

*** 12 inches minimum beyond the edge of the trench on longitudinal open cuts, or 25 feet minimum beyond the trench centerline on perpendicular open cuts, or as determined by the district administrator's designee.

Date: August 27, 2014

LAND USE PERMIT
LUP-LC
Bank Irrevocable Letter of Credit

[Bank Letterhead]

LETTER OF CREDIT BANK AGREEMENT

Date: _____ APPLICANT NAME: _____
Issuing Bank: _____ Tax ID number or Driver's license Number: _____
Address: _____ Telephone Number: _____
City: _____ State_____ Zip Code_____ Address: _____
Amount: _____ City: _____ State _____ Zip Code _____
Expiration Date: _____

VIRGINIA DEPARTMENT OF TRANSPORTATION
Address: _____
City: _____ State _____ Zip Code _____

We hereby issue Irrevocable Letter of Credit number _____ in favor of the Virginia Department of Transportation (the Department) for the account of _____ in an amount not to exceed _____U.S. Dollars ($_____) available by sight draft on the above stated issuing bank accompanied by the documents specified below:

A certified statement signed by the Department's Permit Manager or their representative stating that_____ has not satisfactorily completed work pursuant to the permit issued to the permittee or his agent to perform the work as described on the face of the land use permit in the **County of** _____, Virginia.

A certified statement signed by the Department's Permit Manager or their representative stating that: "**This draw is for the explicit purpose of providing for completion or restoration of the right of way to the terms of the Land Use Permit Regulations and pursuant to the agreement of the permittee or their Agent to perform the work covered by permit to the satisfaction of the Department."** All drafts must bear the clause "Drawn under _____ Irrevocable Letter of Credit No. _____ dated _____ , 20_____." We hereby engage with drawers, endorsers and bona fide holders that all drafts drawn in compliance with the terms of this credit shall be duly honored upon presentation and delivery of this document. This Irrevocable Letter of Credit shall remain in full force and effect for a period of two (2) years from the date hereof and shall automatically renew itself from year to year for three (3) years, one (1) year periods thereafter unless and until the above issuing bank shall give ninety (90) days prior written notice to the department by CERTIFIED MAIL, RETURN RECEIPT REQUESTED, of its intent to terminate same at the expiration of said ninety-day period. During said ninety (90) days notice period, this Irrevocable Letter of Credit shall remain in full force and effect.

During the last thirty (30) days while this Irrevocable Letter of Credit is in force and effect after notice of termination has been given, the Department may draw up to the full amount of this Irrevocable Letter of Credit when accompanied by a document stating that _____ has failed to provide an acceptable substitute Irrevocable Letter of Credit or deposit in an escrow account, and further stating that **"The draw will be held by the Department for the sole purpose of providing for the completion or restoration of the right of way for work covered by the land use permit issued to _____ until such work is completed or restored to the Department's satisfaction**. **This Irrevocable Letter of Credit shall be terminated upon the Department's Permit Manager or their appointed representative giving written release stating that the terms of the permit have been completed and accepted by the Department."** Requests for the termination of this Irrevocable Letter of Credit should be addressed to the local Department office that issued the land use permit.

Except as otherwise expressly stated herein, this credit is subject to the Uniforms Customs & Practices for Documentary Credit (2007 Revision), International Chambers of Commerce Publication No. 600.

Attest: _____

_____
(Seal)

_____
Authorized Signature

_____
Type or Print Name

_____
Title

Land Use Permit Regulations
LUP-SB Surety Bond

BE KNOWN THAT WE as Principal, and_____, a corporation duly incorporated under the Laws of the State of _____, as Surety, are held and firmly bound unto the Commonwealth of Virginia in the full and just sum of _____ U.S. Dollars ($ _____), to be paid to the Commonwealth of Virginia to the payment whereof we hereby bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents, sealed and dated this _____ day of _____ (month), 20_____ (year).

WHEREAS, The said Principal hereunder has been or will be granted permit(s) authorizing one or more of the following activities;(A) to move house property upon public highways of Virginia (B) to cut surface of the highways of Virginia, or to tunnel under such highways; (C) to install and/or erect and maintain telephone, electric power lines, water, sewer, gas or other utilities on, under or over such highways, bridges or tunnels;(D) to install an entrance or tie-in into a public roadway and/or grading upon the Right -of-way; or (E) for the following purposes: Explain below exact purpose(s) for which surety coverage is being obtained:

_____

_____

Work to be performed in the county, city or town of: _____

THEREFORE, The conditions of this obligation are such that if the said Principal shall in all respects comply with the terms and conditions of said permit(s), and fully meet and perform obligations thereunder in accordance with requirements for permits as set forth in the Land Use Permit Manual in effect at time of permit issuance, and shall satisfactorily complete the work permitted, and shall indemnify and save harmless the Commonwealth of Virginia against and from all loss, cost, expense damage or injury to highways and bridges and to persons and property lawfully on such highways, growing out of the granting of such permit(s) to said Principal, then this obligation be void, otherwise to be and remain in full force and virtue.

NOW, THEREFORE, It is expressly understood that this Bond may be canceled by the Surety at the expiration of sixty (60) days from the date which the Surety shall have lodged with the Commonwealth Transportation Commissioner or his designees written notice to so cancel. This provision, however, shall not operate to relieve, release or discharge the Surety from any liability already accrued, or which shall accrue, on permits issued before the expiration of the sixty-day period. **Bonds securing performance on specified active permit(s) may be canceled only upon satisfactory completion of permit(s), as determined by the Department Engineer**.

NOTE: Continuous Bond cannot be canceled unless facilities covered by the permit have been removed from the Right -of-way, or the principal has arranged for replacement surety protection. **ALL permit work covered under section (C) above shall be covered by a bond at all times.**

Said principal and surety, being properly authorized, have caused these presents to be executed and their seals affixed the day and year first above written.

Surety name _____
Bond number _____
Address_____
City _____ State _____ ZIP _____
Contact person _____
Telephone number _____
Attorney-in-Fact Name _____
Signature _____

Principal name _____
TAX ID # or DMV ID # _____
Address _____
City _____ State _____ ZIP _____
Contact person _____
Telephone number _____
Signature _____

POWER OF ATTORNEY AUTHORIZATION TO BE ATTACHED
Acknowledgement of Principal
Attorney-In-Fact
(Seal)
STATE OF _____ COUNTY / TOWN / CITY OF _____
I, the undersigned, a Notary Public in and for the County / Town / City aforesaid, in the State aforesaid, do certify that, _____whose name as Principal is signed to the foregoing writing bearing date this_____ day of _____ (month), 20_____ (year), personally appeared before me and acknowledged the same.
Given under my hand this day of _____ (month), 20____ (year)
My Commission expires: _____

_____
Notary Public
Affidavit and Acknowledgement of Surety
STATE OF _____ COUNTY/TOWN/CITY OF _____
I, the undersigned, a Notary Public in and for the County/Town/City aforesaid, in the State aforesaid do certify that, . (Name of Attorney in Fact) personally appeared before me and made oath that he is . (Title) of the (Name of Surety), that he is duly authorized to execute the foregoing bond by virtue of a certain power of attorney of said company; that said power of attorney has not been revoked; that the said company has complied with all the requirements of law regulating the admission of such companies to transact business in the State of Virginia; that the said company holds the certificate of the Commissioner of Insurance authorizing it to do business in the State of Virginia; that it has a paid-up cash capital of not less than $250,000; that the paid-up capital plus the surplus and undivided profits of said company is $; that the penalty of the foregoing bond is not in excess of ten percentum of said sum; that the said company is not by said bond incurring in the aggregate, on behalf or on account of the principal names in said bond, a liability for an amount lager than one-tenth of its paid-up capital, plus its surplus and undivided profits; that the said company is solvent and fully able to meet promptly all its obligations, and the said (Attorney in fact name) thereupon, in the name and on behalf of the said company, acknowledged the foregoing writing as its act and deed.
Given under my hand this _____ day of _____ (month), 20____ (year)
My Commission expires: _____

_____
Notary Public
Original to be filed with the Virginia Department of Transportation
Request for Land Use Permit Surety Bond Cancellation may be addressed to:
Virginia Department of Transportation

_____
_____

LAND USE PERMIT
RESOLUTION
August 26, 2014

[County, City or Town Letterhead]

"RESOLUTION"

WHEREAS, it becomes necessary from time to time for the *[County, City or Town]* of *[County, City or Town Name]* to obtain land use permits from the Virginia Department of Transportation to install, construct, maintain and operate certain public works and public utilities projects along, across over and upon highway systems of the Commonwealth of Virginia; and,

WHEREAS, expense, damage or injury may be sustained by the Commonwealth of Virginia growing out of granting to the *[County, City or Town]* of *[County, City or Town Name* by the Virginia Department of Transportation of said permits for the work aforesaid;

NOW, THEREFORE, BE IT RESOLVED by the *[County, City or Town] [Board of Supervisors, City or Town Council]* this *[Date]* day of *[Month]*, *[Year]*:

Section 1: That in accordance with the provisions of Section 24VAC30-151-720 of the Land Use Permit Regulations of the Virginia Department of Transportation, the *[County, City or Town]* of *[County, City or Town Name]* does hereby grant assurances to the Virginia Department of Transportation (VDOT) that it shall in all respects comply with all of the conditions of the permit or permits that have been, or will be, granted to the *[County, City or Town]* of *[County, City or Town Name]* and that said jurisdiction does hereby certify that it will carry liability insurance for personal injury and property damage that may arise from the work performed under permit and/or from the operation of the permitted activity as follows: up to one-million dollars ($1,000,000) each occurrence to protect the Commonwealth Transportation Board members and the Virginia Department of Transportation's agents or employees; seventy-five thousand dollars ($75,000) each occurrence to protect the Commonwealth Transportation Board, the Virginia Department of transportation or the Commonwealth of Virginia in the event of suit.

Section 2: That the County Administrator, City or Town Mayor, or their designee, be, and hereby is authorized to execute on behalf of the *[County, City or Town]* of *[County, City or Town Name]* all land use permits and related documents of the Virginia Department of Transportation.

Section 3: That this resolution shall be a continuing resolution and shall not be revoked unless and until sixty (60) days written notice of any proposed revocation be submitted to the Virginia Department of Transportation.

Section 4: That the *[County, City or Town]* of *[County, City or Town Name]* shall, if requested by the Virginia Department of Transportation, provide a letter that commits to using the surety provided by its contractor or to have the contractor execute a dual obligation rider that adds the Virginia Department of Transportation as an additional obligee to the surety bond provided to the locality, with either of these options guaranteeing the work performed within state maintained right-of-way under the terms of the land use permit for that purpose.

BE IT STILL FURTHER RESOLVED that the County Administrator, City or Town Mayor, or their designee, be, and hereby is authorized and directed to procure insurance required by Section 1 herein.

The foregoing Resolution was adopted by the [County Board of Supervisors, City or Town Council] at its regular meeting held on [Day, Month, Year] in [County, City or Town Name], Virginia.

[Authorized Signature]
[Printed Name & Title]
[County, City or Town Name]

LAND USE PERMIT
LUP-CSB
Corporate Surety Bond

[Company Letterhead]

CORPORATE SURETY BOND

KNOW ALL MEN BY THESE PRESENTS THAT_____ a public service corporation duly incorporated under the laws of the Commonwealth of Virginia, is held and firmly bound unto the Commonwealth of Virginia in the full and just sum of $_____, current money of the United States, to be paid to the said Commonwealth of Virginia, to the payment whereof _____ binds itself and its heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents, sealed and dated this _____ day of_____ , _____.

WHEREAS, _____ has been or will be granted permits authorizing the following activities: (a) to cut the surface of the highways of the Commonwealth, or to tunnel under such highways, (b) to install and/or erect and maintain gas pipelines and appurtenant facilities on, under or over such highways, bridges, or tunnels.

NOW, THERFORE, The conditions of this obligation are such that, if _____ shall in all respects comply with the conditions of the permit or permits granted or to be granted and the requirements for permits, as set forth in the "Land Use Permit Regulations" in effect at time of issuing permit, and shall indemnify and save harmless the Commonwealth of Virginia against and from all loss, cost, expense, damage, or injury to highways and bridges and to persons and property lawfully on such highways, growing out of the granting of such permits to , _____ then this obligation to be void, otherwise to be and remain in full force and virtue.

This Surety Bond cannot be cancelled unless facilities covered by the permit have been removed from the right of way, or _____has arranged substitute surety protection.

IN WITNESS WHEREOF, _____ being properly authorized has caused these presents to be executed and its seal affixed the day and year first above written.

BY: _____

NAME: _____

TITLE: _____

Form **W-9**

Commonwealth of Virginia
Substitute W-9 Form

Revised July 2014

Request for Taxpayer Identification Number and Certification

Section 1 - Taxpayer Identification

☐ **Social Security Number (SSN)**

☐ **Employer Identification Number (EIN)**

— — — — — — — — — —

Please select the appropriate Taxpayer Identification Number (EIN or SSN) type and enter your 9 digit ID number . The EIN or SSN provided must match the name given on the "Legal Name" line to avoid backup withholding. If you do not have a Tax ID number, please reference "Specific Instructions - Section 1." If the account is in more than one name, provide the name of the individual who is recognized with the IRS as the responsible party.

Dunn & Bradstreet Universal Numbering System (DUNS) (see instructions)

— — — — — — — — — —

Legal Name:

Business Name:

Entity Type		**Entity Classification**		**Exemptions (see instructions)**
☐ Individual	☐ Corporation	☐ Professional Services	☐ Medical Services	Exempt payee code (if any):
☐ Sole Proprietorship	☐ S-Corporation	☐ Political Subdivision	☐ Legal Services	(from backup withholding)
☐ Partnership	☐ C-Corporation	☐ Real Estate Agent	☐ Joint Venture	_____
☐ Trust	☐ Disregarded Entity	☐ VA Local Government	☐ Tax Exempt Organization	Exemption from FATCA reporting code (if any):
☐ Estate	☐ Limited Liability Company	☐ Federal Government	☐ OTH Government	
☐ Government	☐ Partnership	☐ VA State Agency	☐ Other	_____
☐ Non-Profit	☐ Corporation			

Contact Information

Legal Address:	Name:	
	Email Address:	
City: State : Zip Code:	Business Phone:	
Remittance Address:	Fax Number:	
	Mobile Phone:	
City: State : Zip Code:	Alternate Phone:	

Section 2 - Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined later in general instructions), and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions: You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See instructions titled Certification

Printed Name:		
Authorized U.S. Signature:		Date:

LAND USE PERMIT
LUP-WZTCC
Work Zone Traffic Control Certification
August 27, 2014

VDOT Work Zone Traffic Control Certification

In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification, Special Provision 105.14, beginning July 1, 2009, all activities performed under the auspices of a VDOT Land Use Permit involving the installation, maintenance and removal of work zone traffic control devices must have at least one (1) person on-site who, at a minimum, is accredited by VDOT in Basic Work Zone Traffic Control. The person accredited by VDOT in Basic Work Zone Traffic Control may install, maintain and remove work zones that are in accordance with the Virginia Work Area Protection Manual and/or a work zone that has been preapproved by VDOT. A person accredited by VDOT in Intermediate Work Zone Traffic Control must be on-site to provide supervision during work zone adjustments or changes to traffic control due to field conditions. These persons must have their accreditation card with them while on the project site.

NON-COMPLIANCE MAY RESULT IN PERMIT SUSPENSION &/OR A STOP WORK ORDER

Applicant: _____

Project Name: _____

District: _____ **County:** _____ **Route Number:** _____

Please select one of the following:

[ ] In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification, Special Provision 105.14, I, _____, state that I will have at least one (1) person that is accredited by VDOT in Basic Work Zone Traffic Control who will be responsible for the placement, maintenance and removal of work zone traffic control devices within the project limits in compliance with the permit requirements and conditions, the approved plans, specifications, the Virginia Work Area Protection Manual and the Manual of Uniform Traffic Control Devices. A person accredited by VDOT in Intermediate Work Zone Traffic Control will be on-site to provide supervision during work zone adjustments or changes to traffic control due to field conditions. These persons will provide evidence of their accreditation upon request from VDOT personnel.

[ ] In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification, Special Provision 105.14, the requested activity does not involve the installation, maintenance and removal of work zone traffic control devices and therefore is exempt from the Basic Work Zone Traffic Control requirement.

_____ *Signature*

Date

THIS DOCUMENT MUST ACCOMPANY THE VDOT LAND USE PERMIT APPLICATION

VIRGINIA WORK ZONE TRAFFIC CONTROL TRAINING OPTIONS

The following three options are available to receive Work Zone Traffic Control (WZTC) training based on an individual's job duties and responsibilities as required by the FHWA Final Rule on Work Zone Safety and Mobility and the Virginia Department of Transportation:

OPTION 1 – Have someone trained to become a qualified instructor in your company who can then instruct others , utilizing training material provided by VDOT. The following qualifications must be met in order to teach the VDOT Basic, Intermediate, or Advanced WZTC training courses:

- **Basic** – Be flagger certified either by VDOT or by the American Traffic Safety Services Association (ATSSA); posses two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; posses two years of documented experience in conducting training courses; and successfully complete the VDOT WZTC Intermediate or Advanced course or complete the ATSSA Virginia Intermediate/Traffic Control Supervisor (TCS) course.

- **Intermediate** - Be flagger certified either by VDOT or by ATSSA; posses two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; posses two years of documented experience in conducting training courses; complete and posses the ATSSA Virginia Intermediate/TCS certification.

- **Advanced** - Be flagger certified either by VDOT or by ATSSA; posses two years of practical experience in Highway Design, Construction, Maintenance, or Traffic Operations; posses two years of documented experience in conducting training courses; complete and posses the ATSSA Virginia Advanced Traffic Control Design Specialist (TCDS) certification or ATSSA Virginia Intermediate TCS certification.

To become an approved instructor, an application must be completed listing the above qualifications and sent to the chairman of VDOT's WZST committee at the following location:
http://www.virginiadot.org/business/resources/wztc/wztc_inst_app_form.pdf

Once a person has become an approved instructor, training material can be obtained from VDOT using the order form obtained from the following location (requires an approved instructor identification number):
http://www.virginiadot.org/business/resources/wztc/WZTC_order_form.pdf

OPTION 2 – Obtain the services of an approved instructor from VDOT's Approved WZTC Instructor List to teach the course or courses you need for your employees.

The Approved WZTC Instructor's List can be obtained at the following location:
http://www.virginiadot.org/business/resources/wztc/Approved_WZTC_Instructors.pdf

A list of Approved Providers of training can be obtained at the following location:
http://www.virginiadot.org/business/resources/wztc/wztc_training_sponsors.pdf

OPTION 3 – Send personnel to classes conducted by approved sources such as ATSSA Virginia or the Virginia Local Technical Assistance Program (LTAP).

Courses by ATSSA Virginia can be found at the following location:
http://atssa.com/cs/course_information/courses_by_state?state=56

Courses by the Virginia LTAP can be found at the following location:
http://ltap.cts.virginia.edu/2%20Page%20Calendar%20June%20-%20Sept%2009.pdf

Basic WZTC courses by the Virginia Rural Water Association can be found at the following location:
http://www.vrwa.org/ (See Training Schedule)

Training by the Virginia Transportation Construction Alliance (VTCA) can be found at the following location: **http://vtca.org/**

Visit the following site for additional information regarding Virginia's Work Zone Traffic Control training program:
http://www.virginiadot.org/business/trafficeng-WZS.asp

APPENDIX C

WATER SPECIFICATIONS
(14 PAGES)

WATER SPECIFICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies materials and procedures for construction of underground water distribution systems. This includes piping, structures, appurtenances and all other incidentals.

1.2 COORDINATION

A. Coordinate connection to water mains with Town of Altavista Utility Department. Provide schedule at least 1 week in advance of any connections or requested water disruptions/outages.

B. Physically locate existing utilities prior to connections and construction. Contractor is responsible for contacting VA-811 (Miss Utility).

C. Coordinate all construction activities with appropriate departments/agencies/utilities regard to public safety. Coordination will include but may not be limited to:

1. Town of Altavista Utility Department (water/sewer)
2. Town of Altavista Public Works and/or VDOT (traffic)
3. Utility companies (crossing of existing utilities, temporary pole shoring, etc.)
4. Federal and State agencies such as DEQ, COE, VMRC, etc. (stream crossing and environmental issues).

D. Owner will provide a water model for all new extensions of water mains which will install a new fire hydrant. Town of Altavista approval will be required of the construction plans and water model.

E. The developer/owner shall include the following master notes on the site plan submitted to the Town for review.

1. The Town of Altavista administers business license and zoning ordinance programs (434-369-5001). Campbell County administers Land disturbances (erosion and sediment control) and building code programs (434-332-9506). Permits for work in the public street right of way are administered by Town of Altavista or VDOT (434-946-7631).
2. All water and sewer improvements projects, whether in connection with a subdivision, a commercial development (i.e., site plans) or Town of Altavista funded maintenance work and capital projects, shall be constructed according to Town of Altavista specifications.
3. All materials shall be approved by the Town of Altavista Utility Department or authorized Town representative before installation.
4. The town shall provide and set water meters. Developer shall furnish and install all other materials, including meter boxes, meter yokes, fire hydrants, valves, valve boxes, manholes, and clean-outs according to Town of Altavista specifications.
5. The contractor shall maintain a set of approved plans on the job site at all times during the construction.
6. Call VA-811 (Miss Utility) before digging to have underground utilities marked.

F. All approved plans shall be signed by developer/owner and Town manager prior to approval and construction.

G. All testing shall be paid for by the developer, witnessed by the Town of Altavista at its discretion and certified by a licensed professional engineer.

H. The contractor shall restore the disturbed areas (i.e., backfill, compact, fertilize/seed/straw and patch pavement) to original condition or better.

I. As-built drawings certified by a licensed professional engineer shall be provided to the town prior to release of any surety bond.

1.3 SUBMITTALS:

A. Shop drawings will be reviewed and signed by the contractor and owner’s engineer prior to submission to the Town. Provide four (4) copies of shop drawings for all of the following listed items:

1. Pipe, pipe restraint devices and fittings
2. Valves and valve boxes (including air release valves)
3. Casings and casing spacers
4. Fire hydrants
5. Backflow Prevention assemblies
6. Double check detector check assemblies
7. Meter settings including all service elements from the water main to the private property owner side of the meter service stub-out
8. Vaults and manholes including hatches, frames, covers, steps, bollards, pipe boots, and any other item associated with such appurtenances

B. Construction materials are not approved until the Town has returned a signed copy of submittals to the contractor or owner.

1.4 QUALITY ASSURANCE:

A. All materials shall be new, best quality and in accordance with appropriate AWWA specifications.

B. Comply with all manufacturer recommendations regarding delivery, storage, and handling of materials.

C. Products Criteria:

1. When two or more units of the same type or class of materials or equipment are required, these units shall be products of one manufacturer.
2. A nameplate bearing manufacturer's name or trademark, including model number, shall be securely affixed in a conspicuous place on equipment. In addition, the model number shall be either cast integrally with equipment, stamped, or otherwise permanently marked on each item of equipment.

D. Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products for at least three years. Digital electronic devices, software and systems such as controls, instruments or computer work stations shall be the current generation of technology and basic design that has a proven satisfactory service record of at least three years.

E. Regulatory requirements:

1. Comply with the rules and regulations of the Virginia Department of Health and Town of Altavista having jurisdiction for potable water-service and fire-suppression water-service piping.
2. Comply with standards of authorities having jurisdiction for potable water-service piping including materials, installation, testing, and disinfection.
3. Comply with NSF 61, "Drinking Water System Components--Health Effects," for materials for potable water.

F. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Town of Altavista prior to installation.

1.5 WARRANTY

A. The Contractor shall remedy any defect due to faulty material or workmanship and pay for any damage to other work resulting therefrom within a period of one year from final acceptance. Further, the Contractor will furnish all manufacturers' and supplier's written guarantees and warranties covering materials and equipment furnished as part of the Town of Altavista water system. Performance bonds may be held by the Town of Altavista for the year following final acceptance.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE AND FITTINGS

A. Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot or push-on-joint bell and plain spigot. Pipe shall be Pressure Class 350 and rated for a minimum working pressure of 350 psi.

1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Flanged Ductile Iron Pipe: AWWA C115/A21.11, with factory applied screwed long hub flanges.

1. Flanges: 125 pound fittings meeting ANSI/ASME B 16.42, or meeting ANSI/ASME B 16.1 for fittings not available in ductile iron. Verify pressure rating with Town of Altavista prior to submission of plans.

2. Pipe and fittings above grade or within vaults/manholes are to be painted. Pipe shall be shop primed with one coat of rust inhibitive primer. Final paint color shall be coordinated with Town of Altavista.

C. Cement Mortar Internal Lining: Cement mortar lining and bituminous seal coat as per AWWA C104.

D. Exterior Pipe Coating: The exterior of pipe shall have the standard asphaltic coating.

2.2 POLYVINYL CHLORIDE PIPE AND FITTINGS

A. PVC, AWWA Pipe: ASTM D2241 for smaller than 4-inch and AWWA C900 (or AWWA C909 for PVCO) for 4-inch and larger diameter. Joints should be push-on type with rubber rings conforming to ASTM D3139 and ASTM F477. Pipe shall be minimum DR 14 and rated for a minimum working pressure of 250 psi.

1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

   a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

2.3 PE PIPE AND FITTINGS

A. PE, AWWA Pipe: AWWA C901, minimum SODR No. 9; CTS Sizing, with PE compound number required to give pressure rating not less than 200 psi.

B. PE Fittings: Stainless steel stiffeners required for all fittings, connections, and couplers with PE tubing.

2.4 COPPER TUBE AND FITTINGS

A. Copper Tubing (buried): ASTM B88, Type K water tube, annealed temper, rated for minimum working pressure of 250 psi.

B. Copper Tubing (within structures and vaults): ASTM B88, Type L water tube, hard drawn.

C. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper alloy, solder joint pressure fittings or compression type conforming to ANSI B16.26 for copper tubing rated for a minimum 250 psi working pressure.

D. Brazing Alloy: AWS A5.8/A5.8M, Classification BCuP.

E. Copper Unions: ANSI MSS SP-123, cast copper alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.

2.5 CASING PIPE AND APPURTENANCES

A. Steel Casing pipe: ASTM B88, minimum 0.25-inch thick or per regulatory authority which the casing pipe crosses. No coating for casing pipe. Full circle butt weld joints.

B. PVC, Schedule 40 Pipe: ASTM D1785.

1. PVC, Schedule 40 Socket Fittings: ASTM D2466.

C. PE Casing Pipe: PE casing pipe shall conform to ASTM D 3035, minimum DR 17 or thickness as required to protect the carrier pipe at A16 loading at the installed depth of the casing, whichever is thicker.

D. Casing spacers and spider: Shall be required for carrier pipe 6-inch and larger and shall be painted metal or plastic. Spacers will not contain any wood materials.

E. Seals: Seals for carrier pipe 6-inch and larger shall be neoprene specifically constructed for casing seals. Brick and mortar will be permitted as well.

2.6 VALVES

A. Gate Valves:

1. Non-rising Stem, Resilient-Seated Gate Valves: AWWA C515, ductile-iron body and bonnet; with bronze or ductile-iron gate, resilient seats, bronze non-rising stem, and stem nut. Valve shall have O-ring seals and open counter-clockwise, ends shall be compatible with piping systems in which valves are installed. Valves shall be rated for at least 250 psi working pressure. Include interior coating according to AWWA C550, and mechanical-joint ends for buried installations and flanged in vaults and interior applications. Gate valves will be American Flow Control, Mueller, Kennedy or approved equal gate valve with stainless steel stem.

2. Non-rising Stem, Resilient-Seated Gate Valves smaller than 4” diameter: Lead free brass and bonnet; resilient seats, bronze non-rising stem, and stem nut. Valve shall open counter-clockwise, ends shall be compatible with piping systems in which valves are installed. Valves shall be rated for at least 200 psi working pressure.

3. Underground valve nut: Furnish valves with 2 inch (50 mm) nut for socket wrench operation.

4. Aboveground and pit operation: Furnish valves with hand wheels.

B. Gate Valve Accessories and Specialties

1. Tapping-Sleeve Assembly: ANSI MSS SP-60; sleeve and valve to be compatible with the drilling matching.

a. Tapping Sleeve: Stainless-Steel, two-piece bolted sleeve. Sleeve to match the size and type of pipe material being tapped.

b. Valve shall include one raised face flange mating tapping-sleeve flange.

c. Tapping Sleeve shall be Romac SST or approved equal.

2. Valve Box: Adjustable Cast-iron box of two piece type, consisting of lid, sliding extension and base. Lettering "WATER" shall be embossed on the valve box lid in letters not less than 1 inch high. Base shall be proper type and size for the valve with which it was used. Barrel approximately 5 inches (125 mm) in diameter or larger as required to properly access valve stem, and adjustable cast-iron extension of length required for depth of bury of valve.

3. Valve box concrete donut: Precast concrete donut with interior minimum 1/2″ clearance from valve box and will be tapered at the top to minimize catching on lawn or roadway maintenance equipment.

4. Valve box adapter: Rubber compound sized for the diameter of the valve. Adapter will protect valve box base from resting on the valve body

C. Service Saddles, Corporation Valves, and Curb Valves

1. Service-Saddle Assemblies: Saddles will be ductile iron with epoxy coated stainless band, Ford FC202 or approved equal.

2. Corporation Valve: AWWA C800, bronze body and ground-key plug, with threaded inlet and outlet matching service piping material.

3. Curb Valves: AWWA C800, bronze body, ground-key plug or ball, wide tee head, with inlet and outlet matching service piping material, minimum pressure of 200 psi (1375 kPa).

D. Pressure Reducing Valves for Water Mains

1. Pressure reducing valve: ASSE 1003 with pressure of 150 psi (1035 kPa). Coordinate model, manufacturer, size, etc. with Town of Altavista prior to submitting design plans.

2. Install pressure gauge on each side of PRV. Pressure gauge will include ball valve or corp stop upstream of pressure gauge.

E. Air Relief Valves

1. Combination Air Valve: AWWA C512, Float-operated, hydromechanical device to automatically release accumulated air or to admit air during filling of piping.

2. Pressure Rating: 300 psi (2070 kPa)

3. Body components: Cast or ductile iron body, bonnet, and frame, bronze plug, Buna-n needle and seat, stainless steel float

4. Water inlet size: 2-inch NPS

5. Orifice sizes: sized per manufacturer recommendation based on pressure

6. Air Release Valve will be Cla-Val Model 34AR or approved equal.

F. Backflow Preventer

1. Backflow Preventer shall not be located in any area containing fumes that are toxic, poisonous or corrosive.

2. Direct connections between potable water piping and sewer connected wastes shall not exist under any condition with or without backflow protection.

3. Backflow Preventer shall be accessed and have clearances for the required testing, maintenance and repair. Access and clearances shall maintain a minimum of 1 foot (305 mm) between the lowest portion of the assembly and grace, floor or platform. Installations elevated more than 5 feet (1524 mm) above the floor or grade shall be provided with a permanent platform capable of supporting a tester or maintenance person.

G. Double-Check, Backflow-Prevention Assemblies: AWWA C510 for continuous-pressure applications, unless otherwise indicated. Comply with VDH requirements and coordinate design with Town of Altavista prior to submission for approval.

1. Double check Detector Assembly will be Wilkins Model 350DA or approved equal

2. Water Meter: AWWA C700, disc type, at least one-fourth size of detector check valve. Include meter, bypass piping, gate valves, check valve, and connections to detector check assembly.

3. Vault: Precast concrete vault will be sized for diameter of through water piping. Vault shall all minimum 48″ clearance from the bottom of the vault lid to the top of the through piping. Vault shall be minimum 48″ clear width and with minimum interior dimensions to allow for at least 12″ clearance between all pipes and pipe flanges to the interior walls.

   a. Access: A 300 lb or H-20 rated hatch will be required for 4″ and larger assemblies. Hatch will be sized to allow removal and replacement of the assembly within the vault.

   b. Vault shall drain be positively graded to daylight.

4. Valves:

   a. Ball type with threaded ends on inlet and outlet of NPS 2 (DN 50) and smaller.

   b. OS&Y gate type with flanged ends on inlet and outlet of NPS 2-1/2 (DN 65) and larger.

2.7 WATER METERS

A. Residential Water Meters

1. Meters through 2" meter will be Badger Recordall Disc Series or approved equal.

2. Coordinate with Town of Altavista for water meters, piping and vaults for water meters larger than 2".

3. Meters will be 5/8" x ¾" unless otherwise noted on the plans.

4. All meters larger than 5/8″ x 3/4″ will be equipped with a bypass, either in the setter or hard piped around the meter.

B. Meter yoke and box will be Ford model LYLBB-144-233-P4-NL.

C. Tandem meter setter will be Ford TVBHC72-12W-44-33NL setter. Tandem setters will be installed within a meter box.

1. Pressure reducing valves for individual meter services will be will be diaphragm type with adjustable outlet pressure from 25 to 75 psig. Valve will be Wilkins LU70, Watts or approved equal.

2. Meter box will be 18″ diameter circular meter box for tandem setter and in-line PRV. Box will be 24″ deep and supported by minimum 8 bricks. HDPE boxes will be ribbed for strength

3. Frame and cover-Cast iron frame and cover (Ford C32 or equal) with adaptor ring for larger meter box.

2.8 WATER SERVICE BACKFLOW PREVENTER

A. Comply with VDH requirements and coordinate design with Town of Altavista prior to submission for approval.

B. Backflow preventer for residential connections and irrigation systems will be Watts reduced pressure zone assembly series 009 or approved equal and will include integrated valves on both sides. Assembly will be lead-free for all installations associated with potable water. Assembly will include minimum 1″ air gap.

C. Install backflow preventer assembly within minimum 18″ diameter circular HDPE meter box with matching frame and 11½″ cover. Frame and cover will be cast iron. Coordinate size of meter box for services larger than ¾″.

2.9 CONCRETE VAULTS

A. Precast, reinforced-concrete vault: ASTM C858, designed for AASHTO H20-44 load designation.

1. Vault dimensions: Per standard details or minimum 12″ clearance from all pipe bolts and pipe joints.
2. Ladder: Aluminum ladder.
3. All hardware within vaults shall be stainless steel including screws, nuts, bolts, washers, rods, etc. If stainless steel is unavailable for specific hardware components, coordinate use of other material with Town of Altavista prior to installation.
4. Drain: ASME A112.6.3, cast iron floor drain with outlet. Include body anchor flange, light-duty cast iron grate, bottom outlet, and integral or field-installed bronze ball or clapper-type backwater valve.
5. Hatch: H20 Loading, aluminum diamond plates with Type 316 stainless steel hardware. Doors will include hold open arm with aluminum latch. Sized per standard details or as coordinated with Town of Altavista Utility Department.
   a. 300 lb rated hatch in non-traffic areas may be allowed with prior approval from Town of Altavista.
6. Resilient Pipe Connectors: ASTM C923, flexible boot watertight connection with stainless steel band pipe connector and stainless steel internal expansion clamp.
7. Bollards: Concrete filled 6″ diameter steel or cast iron bollards at each corner of the vault to prevent vehicles on the vault top. Round concrete tops and paint bollards safety yellow. Bollards will extend at least 48″ above adjacent grade. Coordinate bollard locations with Town of Altavista.

2.10 FLUSHING HYDRANTS

A. Ground-Type Flushing Hydrants: Non-freeze and drainable, of length required for shutoff valve installation below frost line.

1. Pressure Rating: 150 psi (1035 kPa) minimum
2. Outlet: One, with angled discharge
3. Hose Thread: NPS 2-1/2 (DN 65), with NFPA 1963 external hose thread, and with cast iron cap with brass chain
4. Barrel: Cast iron
5. Valve: Bronze body with plunger closure, and automatic draining
6. Inlet: NPS 2 (DN 50) minimum
7. Hydrant Box: Cast iron with cover, for ground mounting
8. Operating Wrench: One for each unit

B. Hydrant shall be Kupferle Mainguard #78 hydrant or approved equal.

C. Automatic Flushing system will be Hydro-Guard and will require Town of Altavista approval for specifications.

2.11 FIRE HYDRANTS

A. All hydrants shall have removable interiors capable of replacement without digging up the hydrant and be packable under pressure. Threaded joints or spindles shall be bronze and upper and lower barrels shall be of equal

diameter. Upper barrel shall be of sufficient length to permit setting hydrant with barrel flange not more than 4 inches (100 mm) above finished grade. All fire hydrants shall have 6 inch (150 mm) bottom connection. Pressure Rating: 250 psi (1725 kPa). Hydrant valve shall open by turning operating nut to left or counterclockwise. Coordinate exterior finish shall with Town of Altavista Utility Department. Default exterior finish color shall be red alkyd-gloss enamel paint. Outlet threads shall meet NFPA 1963, with external hose thread used by local fire department. Include cast iron caps with steel chains and Pentagon, 1-1/2 inch (38 mm) point to flat operating and cap nuts.

B. Dry-Barrel Fire Hydrants:

1. AWWA C502, freestanding, one NPS 4-1/2 (DN 115) and two NPS 2-1/2 (DN 65) outlets, 5-1/4 inch (133 mm) main valve, drain valve, and NPS 6 (DN 150) mechanical-joint inlet; nipples will be bronze or non-corrosive metals with “National Standard” threads; interior coating according to AWWA C550; cast iron body, compression-type valve opening against pressure and closing.
2. Hydrant will be safety flange, breakaway type so designed that if broken off, the hydrant will remain closed.
3. Hydrants shall be Mueller Super Centurion 240-A423 or approved equal.

2.12 WARNING TAPE AND DETECTION WIRE

A. Warning tape shall be standard, 4 mil. Polyethylene, 3 inch minimum (76 mm) wide tape, detectable type, blue with black letters and imprinted with “CAUTION BURIED WATER LINE BELOW”.

B. Detection wire will be insulated 12 gauge copper wire.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Use pipe, fittings, and joining methods for piping systems according to the following applications:

1. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
2. Do not use flanges for underground piping.
3. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
4. Install Copper Tracer Wire, No. 12 AWG solid, single conductor, insulated. Install in the trench with piping to allow location of the pipe with electronic detectors. The wire shall not be spiraled around the pipe nor taped to the pipe. Wire connections are to be made by stripping the insulation from the wire and soldering with rosin core solder per ASTM 828. Solder joints shall be wrapped with rubber tape and electrical tape. At least every 1000 feet (300 m) provide a 5 pound (2.3 kg) magnesium anode attached to the main tracer wire by solder. The solder joint shall be wrapped with rubber tape and with electrical tape. An anode shall also be attached at the end of each line.

   a. Install tracer wire will with all pipes regardless of material type.

B. Pipe materials and joint systems

1. General:

   a. Below grade water pipe will be ductile iron piping with push-on joints.

   b. Below grade fittings will be ductile iron mechanical joint fittings.

   c. Above grade and piping within vaults will be flanged joint ductile iron pipe.

2. Additional installation conditions

   a. Water mains crossing streams will be encased within concrete to extend longitudinally from top of bank to top of bank.

   b. Water mains crossing public asphalt topped roadways will be encased within steel casings.
      1) Water service lines under public asphalt and gravel roadways will be encased in schedule 40 PVC or min DR 17 HDPE casings.

   c. Water mains under structures will be encased within steel casings.

3. Restrained joint ductile iron pipe will be installed in the following conditions:

   a. Within steel casings

   b. Within concrete encasements for stream crossings

   c. Under Structures

4. PVC pipe with push-on joints may be installed for overland applications with minimal potential for additional utility disturbances with written approval of the Town of Altavista Utility Department.

5. Aboveground and within vault water-Service piping ¾-inch to 3-inch shall be hard copper tube with bronze threaded or compression fittings.

6. Size:

   a. All water mains to be operated and maintained by the Town of Altavista will be a minimum of 2-inch diameter.

   b. All water mains to be operated and maintained by the Town of Altavista with more than one residential water service connection will be a minimum of 4-inch diameter.

   c. All water mains to be operated and maintained by the Town of Altavista with a fire hydrant will be a minimum of 6-inch diameter.

   d. All water mains to be operated and maintained by the Town of Altavista shall be sufficiently sized per a Town of Altavista approved water model.

7. Water service mains serving one or two residential service connections shall be:

   a. Soft copper tube with wrought-copper, solder-joint fittings or couplers for copper tube joints.

   b. PE, AWWA pipe; PE, AWWA fittings; and heat-fusion joints or compression joints.

3.2 VALVE APPLICATIONS

A. Use mechanical-joint-end valves for 3-inch and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use corporation valves, curb valves or ball valves with ends compatible with piping, for 2-inch and smaller installation.

1. Additional installation conditions

   a. Underground Valves, 3-inch and Larger: AWWA, cast iron, non-rising-stem, resilient-seated gate valves with valve box.

   b. Underground Valves, 4-inch and Larger, for Indicator Posts: UL/FMG, cast iron, non-rising-stem gate valves with indicator post.

   c. Use the following for valves in vaults and aboveground:
      1) Curb stop, Corp valve or Ball Valves, 2-inch and Smaller: Bronze, non-rising stem.
      2) Gate Valves, 3-inch and Larger: AWWA, cast iron, OS&Y rising stem, resilient seated.

3.3 DUCTILE IRON PIPE

A. Install Ductile Iron, water-service piping according to AWWA C600 and AWWA M41-3rd Edition.

1. Install PE corrosion-protection encasement according to ASTM A674 or AWWA C105/A21.5.

B. Pipe shall be sound and clean before laying. When laying is not in progress, the open ends of the pipe shall be closed by watertight plug or other approved means.

C. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Bevel cut ends of pipe to be used with push-on bell to conform to the manufactured spigot end. Cement lining shall be undamaged.

D. Push on joints shall be made in strict accordance with the manufacturer’s instruction. Pipe shall be laid with bell ends looking ahead.

3.4 PVC PIPE

A. PVC piping shall be installed in strict accordance with the manufacturer’s instructions and AWWA C605. Place selected material and thoroughly compacted to one foot above the top of the pipe.

3.5 COPPER PIPE

A. Copper piping shall be installed in accordance with the Copper Development Association’s Copper Tube Handbook and manufacturer’s recommendations.

3.6 ANCHORAGE INSTALLATION

A. Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include: concrete thrust blocks, locking mechanical joints, set-screw mechanical retainer glands, bolted flanged joints, heat-fused joints, pipe clamps and tie rods.

B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Gasketed-Joint, Ductile Iron, Water-Service Piping: According to AWWA C600.

2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.

C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

D. Contractor may utilize restrained joint pipe in lieu of or to supplement other anchorage systems. Contractor will provide documentation from manufacturer of adequacy of restrained joint pipe or alternative anchorages.

E. Restrained joint pipe, restrained joints, grip rings, mega-lugs, etc. will utilize a **250 psig** pressure (unless otherwise approved by the Town of Altavista Utility Department in reduced pressure areas) with a **factor of safety of 2.0 to 1** for design of joint restraints. Main-line valves will be treated as dead-ends regarding restraint design.

1. Joint restraint lengths may be reduced due to reduced static and pump pressures in limited locations as coordinated with the Town of Altavista Utility Department.

3.7 VALVE INSTALLATION

A. Gate Valves: Install each underground valve with stem pointing up and with valve box. Install valves in accordance with manufacturer's recommendations, AWWA C600, or applicable standards. Use mechanical-joint-end valves for 3-inch and larger for underground installations.

B. Install concrete donuts for all valves located within gravel or vegetated areas.

C. Install valve box adaptor between valve body and valve box base.

D. Install in-line valves and fire hydrant shutoff valves within the right-of-way behind the ditchline, behind the guardrail, or beyond the top of slope and/or outside of the clear zone per Town of Altavista or VDOT requirements when possible. Contractor will coordinate all valve locations with the Town of Altavista Utility Department and VDOT prior to installation.

E. Contractor will be permitted to roll the alignment in order to install valves in locations suitable to the Town of Altavista and/or VDOT. Contractor will coordinate all alignment shifts with the Town of Altavista Utility Department prior to installing pipe and valves.

3.8 DETECTOR-CHECK VALVE INSTALLATION

A. Install in vault or aboveground and for proper direction of flow. Install bypass with water meter, gate valves on each side of meter, and check valve downstream from meter.

B. Support detector check valves, meters, shutoff valves, and piping on brick or concrete piers.

3.9 WATER METER INSTALLATION

A. General: Install all meter components excluding the meter. Meter will be provided and installed by the Town of Altavista.

B. Contractor will be responsible for coordination of the location and grade for water services with the Town of Altavista Utility Department. Contractor will determine required connection point and elevation to verify that service can be installed. Contractor will notify Town of Altavista prior to laying water main if there is a conflict regarding service layout or location.

C. Install pressure reducing valves on all residential meters unless noted or otherwise instructed by Town of Altavista Utility Department.

D. Install stainless steel inserts within all fittings, couplings, and connections to main line and meters for PE tubing.

E. Extend service pigtail at least 36" outside of meter box on downstream side and cap. Do not crimp end of service pigtail.

3.10 BACKFLOW PREVENTER INSTALLATION

A. Install backflow Preventers of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.

B. Do not install backflow Preventers that have relief drain in vault or in other spaces subject to flooding.

C. Do not install bypass piping around backflow Preventers.

D. Support 2-1/2-inch and larger backflow Preventers, valves, and piping near floor and on brick or concrete piers.

3.11 CONCRETE VAULT INSTALLATION

A. Install precast concrete vaults according to ASTM C891.

3.12 FLUSHING HYDRANT INSTALLATION

A. Install post-type flushing hydrants with valve below frost line and provide for drainage. Support in upright position. Include separate gate valve or curb valve and restrained joints in supply piping.

B. Install ground-type flushing hydrants with valve below frost line and provide for drainage. Install hydrant box flush with grade. Include separate gate valve or curb valve and restrained joints in supply piping.

C. Install sampling stations with valve below frost line and provide for drainage. Attach weather-resistant housing and support in upright position. Include separate curb valve in supply piping.

3.13 FIRE HYDRANT INSTALLATION

A. General: install each fire hydrant with a separate gate valve in the supply pipe, anchor with restrained joints, mega-lugs, rodding back to mainline tee and/or thrust blocks, and support in upright, vertical position. Contractor will provide manufacturer's documentation regarding acceptability of restrained joints, mega-lugs, and/or rodding if used in lieu of concrete thrust blocks. Fire hydrants shall be installed on 6 inches or larger lines only.

B. Install fire hydrants within the right-of-way behind the ditchline, behind the guardrail, or beyond the top of slope and/or outside of the clear zone per Town of Altavista and VDOT requirements. Contractor will coordinate all hydrant locations with the Town of Altavista (and VDOT if outside of Town limits) prior to installation.

C. All fire hydrant leads will be ductile iron pipe from the mainline tee to the hydrant base.

D. AWWA-Type Fire Hydrants: Comply with AWWA M17.

E. High Ground Water Location: Relocate fire hydrants when excavation reveals high ground water or plug the hydrant drain hole if unable to relocate. Notify the Town of Altavista Utility Department in writing when hydrant drain holes are plugged.

F. Coordination with local fire department: Notify local fire departments of work area, approximate work schedule, and all water mains & fire hydrants which may be impacted by utility work.

G. Provide signage and/or provide cover to denote fire hydrants which are not usable by fire department. Coordinate signage and/or cover with local fire department.

3.14 FIELD QUALITY CONTROL

A. Notify Town of Altavista Utility Department at least 48 hours in advance of the test date, and perform tests in presence of the Engineer.

B. Contractor is prohibited from making service taps prior to pressurized testing of the water main.

C. Town of Altavista will supply potable water for pipeline testing at no cost (to the Owner/Contractor) equal to two times the pipe volume. Master meters are to be installed and in service prior to filling and flushing the lines. Contractor will provide an estimated volume of water required for flushing, testing, and disinfection. All water in excess of this volume will be purchased by the Contractor/Owner from the Town of Altavista.

D. After the line has been back-filled and at least seven days after the last concrete reaction anchor has been poured, subject the line or any valved section of the line to a hydrostatic pressure test in accordance with AWWA C600, except as modified herein. Fill the system with water at a velocity of approximately 1 ft. per second while necessary measures are taken to eliminate all air. After the system has been filled, raise the pressure by pump to 1.5 times the working pressure or up to the rated pressure of the pipe, whichever is less. Test pressures shall be:

1. Not be less than 1.25 times the working pressure at the highest point along the test section

2. Not exceed thrust restraint pressure

3. Not vary by more than +/- 5 psi
4. Not exceed the rated pressure of the valves or hydrants when test includes closed gate valves
5. Shall be at least **200 psig** as measured at the high point on the section of line under tests. Town of Altavista Utility Department may elect to reduce the pressure of the test dependent upon location within the water system.
6. Measure pressure at the low point on the system compensating for gage elevation. Maintain this pressure for two hours. If pressure cannot be maintained, determine cause, repair, and repeat the test until successful.

E. A leakage test shall be conducted concurrently with the pressure test in accordance with AWWA C600, except as modified herein. Leakage shall be determined with a calibrated test meter, furnished by the Contractor. Leakage is defined as the quantity of water required to maintain a pressure within 5 psi of the specified test pressure, after air has been expelled and the pipe filled with water. Leakage shall not exceed the volumes listed in AWWA C600. If leakage exceeds that specified, find and repair the leaks and repeat the test until successful.

F. All visible leaks shall be repaired regardless of the amount of leakage.

G. Prepare reports for testing activities.

3.15 IDENTIFICATION

A. Install continuous underground warning tape 12 inches (300 mm) directly over piping.

B. Install continuous 12 gauge coated copper wire adjacent to all water main and water service piping. Overlap at least 24” of wire and twist sufficiently that wire will not separate for breaks.

1. Expose at least 12” of copper wire within all meter boxes for service lines back to the main.
2. Loop copper wire within valve boxes to within 6” of top of valve box cover of all in-line and hydrant valves. Loop copper wire within air release valves vaults/manholes such that it is accessible.

3.16 SEPARATION OF WATER AND SEWER LINES

A. General: Comply with Virginia Department of Health latest standards for separations of water mains, sanitary sewers and sanitary septic systems.

B. Waterlines shall normally be separated horizontally from sanitary sewer lines, manholes, and septic system drainfields by a distance of 10 feet measured edge-to edge.

C. Under unusual conditions when local conditions prevent a horizontal separation of 10 feet from sewer lines and manholes, the water line may be laid closer provided the invert of the water main is 18 inches above the top of the sewer; the sewer constructed of AWWA approved and tested water pipe; and all manholes are of water tight construction tested in place. The sewer pipe shall be pressure tested in place without leakage prior to backfilling.

D. Waterlines crossing sewers shall be laid to provide at least 18 inches vertical separation between that the invert of the water main and the top of the sewer pipe.

E. Under unusual conditions when local conditions prevent an 18-inch vertical separation, the sewer line passing over or under water mains shall be constructed of AWWA approved water pipe. The sewer pipe shall be pressure tested in place without leakage prior to backfilling. Water lines passing under sewers shall in addition have an 18" vertical separation between the bottom of the sewer and the top of the water line; adequate structural support for the

sewer to protect both utilities; and the water pipe be centered on the crossing point so the joints are equidistant and as far away as possible from the sewer.

F. The Town of Altavista Utility Department will review all unusual sewer and waterline crossing conditions. The crossing conditions will be constructed such that the Town of Altavista Utility Department can approve the condition.

3.17 CLEANING

A. Disinfect and test water lines in accordance with AWWA Standard C651 and the following:

B. All water lines shall be disinfected prior to being in operation.

C. Prior to disinfection all water lines shall be flushed unless the tablet method of disinfection is used. All valves and hydrants shall be operated during this operation. Flushing velocities should not be less than 2.5 ft./sec.

D. Methods of Chlorine Application

1. Continuous feed method - Potable water shall be introduced into the pipeline at a constant flow rate. Chlorine shall be added at a constant rate of this flow so that the chlorine concentration in the water in the pipe is at least 50 mg/L. The chlorinated water shall remain in the pipeline at least 24 hours, after which, the chlorine concentration in the water shall be at least 10 mg/L. All valves and appurtenances shall be operated while the chlorinated water remains in the pipeline.

2. The velocity of the potable water in the pipeline shall be less than 1 ft./sec. The water shall then remain in contact with the pipe for 24 hours. All valves and appurtenances shall be operated while the chlorinated water is in the pipeline.

E. Final Flushing- After the required retention period, the heavily chlorinated water shall be flushed from the lines using potable water.

F. Testing - After the lines have been flushed at a velocity of no less than 3 fps (in accordance with AWWA 651-14), the water lines shall be tested. Samples shall be collected at 1200 feet intervals throughout the length of pipeline.

1. All chlorine residual determinations shall be made using only those methods approved by the Virginia Department of Health.

2. Water samples for bacteriological analysis must be collected at 1200 feet intervals throughout the length of pipeline and analyzed by a certified laboratory using one of the two options below (in accordance with AWWA 651-14):

a. Option A: Two samples taken at least 16 hours apart. A minimum of two samples at least 16 hours apart shall be collected from each sampling location.

b. Option B: Two samples taken at least 15 minutes apart after the pipeline has been disinfected and allowed to sit for a 16 hour rest period.

3. The results of these samples must indicate no coliform contamination before the pipeline can be utilized as part of the waterworks. If contamination is indicated, then the disinfection procedures must be repeated.

G. Water samples will be collected from both connection points (or the connection point and termination point) of the main line. Water samples will be collected from each water main branch larger than 2" as well.

H. Maintain a copy of AWWA Standard C-651 on Project site during all disinfecting operations. An additional copy will be available for review in the office of the Town of Altavista Utility Department.

I. Prepare reports for purging and disinfecting activities.

--- E N D ---

APPENDIX D

NORFOLK SOUTHERN RAILROAD UTILITY CROSSING PERMIT
(PENDING-NOT PROVIDED WITH THIS SUBMISSION)