

*EXECUTION VERSION*

**I-95 HOV/HOT Lanes Project  
Southern Terminus Extension**

**Exhibit C-2**

**Technical Requirements**

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## **PART 2**

### **TECHNICAL INFORMATION & REQUIREMENTS**

#### **1.0 DESIGN-BUILDER'S SCOPE OF WORK**

##### **1.1 Project Description**

The Project is located in Stafford County, Virginia, and involves extending the existing 95 Express Lanes in a southerly direction. The general limits of the Express Lanes extension are from approximate mile marker 142.5 (south of Garrisonville Road) to the existing Express Lanes terminus at approximate mile marker 145.0 (north of Garrisonville Road). New pavement limits are from approximately 0.9 miles south of Garrisonville Road overpass to approximately 1.3 miles north of Garrisonville Road overpass, for a total new pavement limit length of approximately 2.2 miles. Additionally, approximately 0.7 miles on the north end of the Project will require pavement resurfacing and re-striping. This additional roadway, including associated northbound and southbound slip ramps, shall serve as reversible 95 Express Lanes. The Design-Builder shall also provide advisory signage preceding the new 95 Express Lanes entry and exit ramps. The Project lengths are approximations based on the RFP Conceptual Plans shown in the RFP Information Package. The Design-Builder shall not reduce the length of the project limits, reduce the gore lengths, or reduce the widths of the proposed pavement types from the design shown on the RFP Conceptual Plans.

A conceptual design has been developed and made available for public review via a Public Information Meeting held on February 17, 2016. The conceptual design contained in the RFP Information Package reflects a basic line, grade, typical sections, minimum pavement structures, major cross drainage pipes, potential locations of stormwater management ponds, signs, ITS, lighting, and general length and location of sound barrier. These elements are considered to be the basic Project configuration. The Design-Builder is responsible for final design in accordance with the Contract Documents. The PDF copy of the RFP Conceptual Plans shall supersede the electronic drawing files (DGN) contained in the RFP Information Package.

##### **1.2 Anticipated Scope of Work**

The anticipated scope of work to be undertaken by the Design-Builder under the Design-Build contract for this Project will include, but is not limited to:

- Survey
- Developing and completing the design
- Acquiring the necessary environmental permits
- Coordinating and performing, required utility relocations, additions, and adjustments
- Roadway construction
- Paving
- Guardrail/barrier

- Retaining walls
- Sound barrier walls
- Signs, sign structures, and foundations
- Overhead signs structure and other traffic control measures
- Intelligent Transportation System (ITS) components including Closed Circuit Television (CCTV) and Automated Incident Detection (AID) Cameras, Dynamic Message Signs (DMS), Fiber Optic Communications (COMM) Infrastructure
- Gate and gate integration
- Vehicle detectors
- Generator sites
- Power, including service panels
- Coordination with the system integration, and testing and maintenance until final acceptance, and related documentation
- Lighting
- Traffic maintenance and management during all phases of construction
- Pavement markers and markings
- Storm drainage
- Storm water management facilities
- Quality Assurance and Quality Control for design and construction
- Stakeholder coordination
- Overall Project management and coordination with other active construction projects in the vicinity.

Descriptions and technical requirements of the anticipated work are set forth in Part 2, Section 2.

### **1.3 Anticipated Design Services**

Design services shall address all items necessary for construction and operation of the completed facility. Design services are anticipated to include, but are not limited to, those services necessary to produce roadway construction plans relative to the technical disciplines listed in Part 2, Section 1.2 above. Other data collection and technical studies anticipated include, but are not necessarily limited to: geotechnical investigation, borings and analysis, materials analysis, pavement design, foundation design, additional environmental studies and noise analyses, and hydraulic and hydrologic analysis. Offerors should note that all work performed on this Project shall be completed using English Units.

VDOT has prepared an I-95 Express Lanes Southern Terminus Extension Traffic Operations and Safety Report, dated February 16, 2016. The Design-BUILDER will be required to fulfill all commitments included in the Operations and Safety report.

### **1.4 Anticipated Environmental Services**

The Design-Builder shall carry out environmental commitments during design and construction, as applicable, as identified in the Environmental Assessment (EA); the reevaluation of the original Environmental Assessment; the Plans, Specifications, and Estimates (PS&E) Re-evaluation Authorization (EQ-200); and the Environmental Certification/Commitments Checklist (EQ-103). All commitment compliance shall be supported by the appropriate documentation, to be provided by the Design-Builder to the VDOT Project Manager. Further details are provided in Part 2, Section 2.4.

The Design-Builder shall acquire all water quality permits for the Project in the Design-Builder's name (i.e. the Design-Builder will be the "Permitee"). Further details are provided in Part 2, Subsection 2.4.4.

The Design-Builder shall be responsible for compliance with pre-construction and construction-related environmental commitments and will be responsible for compliance with pre-construction, construction-related permit conditions, as well as post-construction monitoring if required by regulatory agencies. The Design-Builder will assume all obligations and costs incurred by complying with the terms and conditions of the permits and environmental certifications. Any fines associated with environmental permits or regulatory violations will be the responsibility of the Design-Builder.

Any changes in scope or Project footprint from that contained in the Contract Documents proposed by the Design-Builder, which are acceptable to VDOT, may require additional environmental technical studies and analysis to be performed by the Design-Builder at their cost. VDOT will coordinate any NEPA document re-evaluations with FHWA. The Design-Builder shall then carry out any additional environmental commitments that result from such coordination at its sole expense and at no additional cost and/or time delays to the Project.

## **1.5 Anticipated Right of Way and Utilities**

It is currently anticipated that all work will be within the existing VDOT right-of-way limits. The Offeror's conceptual design included in its Proposal shall be wholly contained within the existing right of way limits shown on the RFP Conceptual Plans, with the exception of temporary or permanent easements (including utility easements). Utility easements have not yet been identified or shown on the RFP Conceptual Plans.

The Design-Builder's final design shall also be contained within the right of way limits shown on the RFP Conceptual Plans, with the exception of temporary or permanent easements (including utility easements) and where minor adjustments are required during the final design process, and only after approval by VDOT. Should the Design-Builder vary the final design so as to require additional right-of-way and/or easement acquisitions, then the Design-Builder's Right-of-Way team member shall be a VDOT prequalified right-of-way contracting consultant, and must include a VDOT prequalified Fee Appraiser and a VDOT prequalified Review Appraiser. All Right-of-Way acquisitions and relocations shall be performed in accordance with Part 2, Section 2.12 of this RFP.

The Design-Builder shall be responsible for all utility costs related to relocations, adjustments and coordination of utilities. Any required utility easements shall be the responsibility of the Design-Builder. Utility work shall be in accordance with Part 2, Section 2.13 of this RFP. All costs for utility relocations, excluding betterments, shall be included in the Offeror's Price Proposal. Utility betterments shall not be included in the Offeror's Price Proposal but shall be reimbursed to the Design-Builder through agreement with the requesting utility owner. Betterments must be requested by and/or approved by the affected utility owner and must meet Buy America requirements as described in Part 5, Exhibit 102.05(g.1) Use of Domestic Material.

## **1.6 Anticipated Construction Services**

The construction services to be undertaken by the Design-Builder for this Project are anticipated to include, but are not limited to: earthwork, roadway, retaining walls, sound barriers, the demolition and removal of existing structures and appurtenances, paving, sign structures, intelligent transportation systems, roadway lighting, drainage, utility relocations/adjustments and coordination, transportation management plan, traffic control devices, erosion and sediment control, storm water management facilities, guardrail/barrier, and compliance with all environmental requirements, commitments and permit conditions, as described in Part 2, Section 2.0 of this RFP. The Design-Builder shall provide construction engineering inspection and management, quality assurance and quality control, including plant quality assurance inspection and testing, but excluding items listed under Part 2, Section 2.14.2.

## **1.7 Coordination with Active Construction Projects**

The Design-Builder shall be responsible for coordinating with contractors of other active construction projects in the vicinity of the I-95 Express Lanes – Southern Terminus Extension Project in accordance with Section 3.6 of Part 4. In addition, the Design-Builder shall organize and conduct joint meetings (to which VDOT and VDOT designees shall be invited) with other Contractors on a quarterly basis at a minimum, or as requested by VDOT. The ultimate purpose of these meetings is to facilitate achievement of the I-95 Express Lanes Southern Terminus Extension construction program milestones. It is expected that progress milestones will be jointly developed and mutually agreed to by the Design-Builder and Contractors for the projects listed below.

### **I-95/Route 630 Reconstruction and Widening with Bid Option for 4<sup>th</sup> Lane Southbound**

Location: approximately 1.0 miles south of Route 630 to approximately 0.8 miles south of Garrisonville Road overpass

Project Number: 0095-089-F09 (UPC #13558 and #4632)

Status: Design-Build contract RFQ was issued on October 27, 2015 with an anticipated final completion of April 2020

VDOT Contact:  
Michael T. Coffey, P.E.  
District Construction Engineer  
Phone: 540-642-8212  
Email: [MichaelT.Coffey@vdot.virginia.gov](mailto:MichaelT.Coffey@vdot.virginia.gov)

**Route 610 Left Turn Lanes To and From Onville Road**

Location: approximately 0.2 miles west of Route 641 (Onville Road) to approximately 0.1 miles east of Route 641 (Onville Road)  
Project Number: 0610-089-590 (UPC #93225)  
Status: Design-Bid-Build contract was awarded in November 2015

VDOT Contact:  
Michael T. Coffey, P.E.  
District Construction Engineer  
Phone: 540-642-8212  
Email: [MichaelT.Coffey@vdot.virginia.gov](mailto:MichaelT.Coffey@vdot.virginia.gov)

**I-95 Six Bridges Rehabilitation**

Location: I-95 NB GP Lanes and I-95 SB GP Lanes over Aquia Creek  
Project Number: 0095-966-687 (UPC #108326)  
Status: Design-Bid-Build is to be anticipated to be advertised in June 2016

VDOT Contact:  
Sharif Ramsis, P.E.  
Fredericksburg District Structure and Bridge  
Phone: 540-899-4293  
Email: [Sharif.Ramsis@vdot.virginia.gov](mailto:Sharif.Ramsis@vdot.virginia.gov)

**I-95 CCTV Cameras Installation**

Location: I-95 MM 140.8 to MM 140.6 near Courthouse Road  
Project Number: [RCW1]  
Status: Design-Bid-Build [RCW2]

VDOT Contact:  
Dustin Alwood  
Northern Region Operations  
Phone: 571-350-2010  
Email: [Dustin.Alwood@vdot.virginia.gov](mailto:Dustin.Alwood@vdot.virginia.gov)

**Asphalt Plant Mix (PM) Contracts associated with work on or adjacent to I-95**

Location: Stafford County - Various  
Project No.: Various  
Status: PM Contracts to be awarded winter 2016 and subsequent years

VDOT Contact:  
Michael T. Coffey, P.E.  
District Construction Engineer  
Phone: 540-642-8212  
Email: [MichaelT.Coffey@vdot.virginia.gov](mailto:MichaelT.Coffey@vdot.virginia.gov)

In addition to the VDOT projects listed above, the County of Stafford will be administering the following projects:

**Route 610 Garrisonville Road – Widen to 6 Lanes, Phase 2**

Location: approximately 0.1 miles east of intersection of Route 1236 (Shenandoah Lane) to approximately 0.08 miles east of Route 1262 (Travis Lane)  
Project Number: 0610-089-608 (UPC #98847)  
Status: Design-Build contract was awarded in August 2013

VDOT Contact:  
Michael T. Coffey, P.E.  
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Phone: 540-642-8212  
Email: [MichaelT.Coffey@vdot.virginia.gov](mailto:MichaelT.Coffey@vdot.virginia.gov)

**Turn lane Addition-Route 1 South at Garrisonville Road**

Location: Route 610 Garrisonville Road & Route 1 to approximately 0.2 miles north of Route 610  
Project Number: 0001-089-R29 (UPC #103082)  
Status: Design-Bid-Build contract is anticipated to be advertised in March 2016

VDOT Contact:  
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Phone: 540-642-8212  
Email: [MichaelT.Coffey@vdot.virginia.gov](mailto:MichaelT.Coffey@vdot.virginia.gov)

**Intersection Improvement Route 1 & Route 630**

Location: approximately 0.1 miles south of Route 630 (Courthouse Road) & approximately 0.1 miles north of Route 630 (Courthouse Road)  
Project No.: 0001-089-R32 (UPC #103085)  
Status: Design-Bid-Build contract anticipated to be advertised in October 2017

VDOT Contact:  
Michael T. Coffey, P.E.  
District Construction Engineer  
Phone: 540-642-8212  
Email: [MichaelT.Coffey@vdot.virginia.gov](mailto:MichaelT.Coffey@vdot.virginia.gov)

Additionally, Northern Regions Operations (NRO) Contracts or Interstate Maintenance Contracts (TAMS) may be taking place in the project vicinity.

## **2.0 PROJECT TECHNICAL INFORMATION & REQUIREMENTS**

The Offeror's proposed conceptual design shall meet all requirements of the RFP. Proposed deviations from the requirements of the RFP Documents shall not be permitted.

The Design-Builder's final design shall meet or exceed all requirements included in the Contract Documents (which in some cases exceeds the minimum design standards). If the Design-Builder proposes any deviation that results in a modification to the Contract Documents then the Design-Builder shall follow the Value Engineering Proposals (VEP) process as described in Section 104.02 of Division I Amendments to the Standard Specifications (Part 5) (even though the proposed deviations may not qualify as a VEP), unless otherwise directed by VDOT. Ultimately, any modification to the Contract Documents requires VDOT approval.

### **2.1 References and Information**

The design and construction work for the Project shall be performed in accordance with the applicable federal and state laws and VDOT Standards, Specifications and Reference Documents to include, but not limited to the documents listed herein. The Design-Builder must verify and use the latest version of the documents listed herein as of the date of the RFP or latest Addenda. The Design-Builder must meet or exceed the minimum roadway design standards and criteria.

#### **2.1.1 Standards and Reference Documents**

If during the course of the design, the Design-Builder determines that a specific Standard, Specification or Reference Document is required but is not listed herein, it is the responsibility of the Design-Builder to identify the pertinent Standard, Specification, or Reference Document and submit to VDOT for review and approval prior to inclusion in the Contract Documents.

The VDOT 2007 Road and Bridge Specifications, and its associated Special Provision Copied Notes, contain pricing language under sections entitled "Measurement and Payment" that is not applicable in the Design-Build context of this RFP. Thus, in accordance with the hierarchy of documents, the Design-Builder will refer to Part 3, Articles 6 and 7, Part 4, Article 6, and applicable portions of the Division I Amendments (Part 5) to the Standard Specifications for more information regarding the pricing and payment to the Design-Builder. Similarly, other references below which contain pricing methodologies for the "Contractor" shall likewise not be used. The requirements as described in the text of Part 2 herein take precedence over the referenced documents listed below, unless otherwise indicated.

The standards and references for the Project are listed below in the following order: (a) Standards and Specifications; (b) Reference Manuals; (c) Special Provisions List including Special Provisions, Special Provision Copied Notes and Supplemental Specifications. Items (a) and (b) are published references that are available publicly, for which copies are not provided to

the Offerors in the RFP Information Package, but these items are to be used as manuals for design and construction. Items listed in (c) are included in the RFP Information Package.

(a) Standards and Specifications

- 2009 Manual of Uniform Traffic Control Devices (MUTCD), Revisions 1 and 2 and 2011 Virginia Supplement to MUTCD, Revision 1 (2013)
- AASHTO A Policy on Design Standards Interstate System, 5th Edition, January 2005
- AASHTO A Policy on Geometric Design of Highways and Streets, 2011
- AASHTO/AWS D1.5M/D1.5: 2010 Bridge Welding Code, 6th Edition, with 2011 and 2012 AASHTO Interim Revisions
- AASHTO Guide for Design of Pavement Structures (Rigid Pavement and Flexible Pavement), 1993 Edition
- AASHTO – Guide for High-Occupancy Vehicle (HOV) Facilities, 3rd Edition
- AASHTO Guide for Roadway Lighting Design, 6th Edition, 2005
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004
- AASHTO Guide Specifications for Highway Construction, 9th Edition
- AASHTO Guide Specifications for Structural Design of Sound Barriers
- AASHTO LRFD Bridge Design Specifications, 7<sup>th</sup> Edition, 2014; and VDOT Modifications
- AASHTO Manual for Assessing Safety Hardware, First Edition, 2009
- AASHTO/FHWA Joint Implementation Plan for the AASHTO Manual for Assessing Safety Hardware, 2009
- AASHTO Manual on Subsurface Investigations, 1988
- AASHTO Roadside Design Guide, 4th Edition, 2011
- AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, 1994 Edition
- AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, 4th Edition, 2001 (to be used for the design of anchor bolts and dynamic message sign supports only)
- AASHTO Guide Specifications for Structural Design of Sound Barriers – current edition
- ANSI/AWS D1.2/D1.2M: Structural Welding Code - Aluminum, current edition
- ANSI/AWS D1.1/D1.1M: Structural Welding Code - Steel, current edition
- Corps of Engineers EM-1110-2-1906, Laboratory Soils Testing, 1986
- DEQ Virginia Erosion and Sediment Control Handbook, Third Edition, 1992
- DEQ Virginia Stormwater Management Handbook, Vol. 1 and Vol. 2, First Edition, 1999
- DEQ Virginia Stormwater Management Program Technical Bulletin 1
- Engineering Properties of Clay Shales, Report 1 by W. Heley and B. N. McIver
- FHWA 23CFR625 - Design Standards for Highways
- FHWA 23CFR630 Subpart B – Plans, Specifications, and Estimates
- FHWA 23CFR650 - Subpart C – National Bridge Inspection Standards (“NBIS”)

- FHWA 23CFR626 - Part 626 Pavement Policy
- FHWA 23CFR752 Landscaping and Roadside Development
- FHWA 23CFR940—Intelligent Transportation System Architecture and Standards – January 8, 2001
- FHWA 49CFR24 – The Uniform Relocation Assistance and Real Properties Acquisitions Act of 1970
- FHWA Hydraulic Design Series Number 5 (HDS-5), Hydraulic Design of Highway Culverts, 2012
- FHWA Hydraulic Engineering Circular Number 9 (HEC-9), Debris Control Structures – Evaluation and Counter Measures, 2005
- FHWA Hydraulic Engineering Circular Number 15 (HEC-15), Design of Roadside Channels with Flexible linings, Third Edition, 2005
- FHWA Guidelines for the Installation, Inspection, Maintenance and Repair of Structural Supports for Highway Signs, Luminaires, and Traffic Signals (March 2005), FHWA NHI 05-036
- FHWA Mitigation Strategies for Design Exceptions, July 2007
- FHWA Standard Highway Signs including Pavement Markings and Standard Alphabets, 2004 Edition and 2012 Supplement (For use with the 2009 Manual on Uniform Traffic Control Devices for Streets and Highways), or most current Edition
- Highway Traffic Noise Impact Analysis Guidance Manual, dated September 16, 2011
- IEEE National Electric Safety Code
- IEEE 802.3 Local and Metropolitan Area Networks
- IEEE 1512-2006 - IEEE Standard for Common Incident Management Message Sets for Use by Emergency Management Centers
- IEEE 1512.1-2006 – IEEE Standard for Common Traffic Incident Management Message Sets for Use by Emergency Management Centers
- IES RP-08-00, American National Standard for Roadway Lighting
- IES RP-19-01, Roadway Sign Lighting
- Manual of Uniform Traffic Control Devices (“MUTCD”), 2009 Edition and latest updates as of date of release of RFP or applicable addenda
- National Electric Manufacturers Association (NEMA) TS-4 Hardware Standards for Dynamic Message Signs (DMS) with NTCIP Requirements
- NCHRP Report 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features
- NFPA 25 Standard for the inspection, Test and Maintenance of Water-Based Fire Protection Systems, 2014 Edition
- NFPA 502, Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2011 Edition
- Transportation Research Board Highway Capacity Manual, 2010 Edition
- VDOT Appraisal Guidelines
- VDOT CADD Manual 2012 (Revised June 2015)

- VDOT Construction Inspection Manual, January 2015
- VDOT Construction Manual, 2005 (including July 2008 revisions)
- VDOT Drainage Manual, Revised January 2016 (including current Errata Sheet)
- VDOT Guardrail Installation Training Manual (“GRIT”), May 2011
- VDOT Guidelines for 1993 AASHTO Pavement Design, Revised May 2003
- VDOT BMP Design Manual of Practice, Effective April 2013
- VDOT Instructional & Information Memorandums (“I&IM”), All Divisions
- VDOT Land Use Permit Regulations, 24 VAC 30-151, March 17, 2010
- VDOT Land Use Permit Regulations Guidance Manual, March 17, 2010
- VDOT Manual of Instruction for Material Division, including revisions through July 2011
- VDOT Manual of Structure and Bridge Division, Vol. V Series
- VDOT Materials Division Approved List
- VDOT Materials Division Memorandum Number MD299-07 for Materials Acceptance, October 4, 2007
- VDOT Policy Manual for Public Participation in Transportation Projects (Revised August 29, 2011)
- VDOT Post Construction Manual, August 2014 Edition
- VDOT Right of Way Manual of Instructions, Third Edition – FHWA update approved January 1, 2016
- VDOT Road and Bridge Specifications, 2007 (all except Section 100), including all revisions
- VDOT Road and Bridge Standards, Vol. 1 and Vol. 2, 2008, including all revisions
- VDOT Road Design Manual, Vol. I, including all revisions
- VDOT Soil Design Parameters for Sound Barrier Walls, Retaining Walls and Non-Critical Slopes – April 14, 2011
- VDOT Survey Manual, 2010 Edition, including 2011 revisions
- VDOT Traffic Engineering Design Manual, 2014
- VDOT Traffic Engineering Division Numbered Memoranda (Traffic Engineering (TE) and Mobility Management (MM))
- VDOT Utilities Manual of Instruction (January 2011, including February 2011 revisions)
- VDOT Virginia Standard Highway Signs, Revision 1, January 2015
- VDOT Virginia Work Area Protection Manual, June 2011, Rev. 1.
- VDOT’s Minimum Requirements for Quality Assurance & Quality Control on Design Build and Public-Private Transportation Act Projects, January 2012
- VDOT’s Project Management Policy PMO-Policy-2011-1, July 1, 2011
- Virginia Department of Transportation Asbestos Inspection Procedures, dated May 4, 2004
- Virginia Department of Transportation Asbestos Monitoring Procedures, dated May 4, 2004

(b) Reference Manuals

- AASHTO’s Highway Safety Manual, 1st Edition, Vol. 1-3, 2010
- American National Standards Institute (ANSI)/Insulated Cable Engineers Association (ICEA) S-87-640-2006 requirements
- American Water Works Associations Standards
- American Welding Society Standards
- ANSI/IESNA RP-8-00 Roadway Lighting
- Bellcore/Telcordia Standards
- Duncan, J.M. (April 2000) Factors of Safety and Reliability in Geotechnical Engineering, Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Discussions and Closure, August 2001
- Field Partnering Guide for VDOT Projects, November 2005
- FHWA publications HDS-5, HDS-6, HEC-11, HEC-14, HEC-15, HEC-18, HEC-20, HEC-22, and HEC-23
- FHWA Geotechnical Engineering Circular No. 6, Shallow Foundations, September 2002, FHWA-SA-02-054\
- FHWA Hydraulic Design Series No. 4, Introduction to Highway Hydraulics, 2008
- FHWA Manual of Subsurface Investigations, May 2002, FHWA NHI-01-031
- gINT© Manual
- Ground Improvements Reference Manual Volume I, FHWA-NHI-06-019
- Ground Improvements Reference Manual Volume II, FHWA-NHI-06-020
- Institute of Electrical and Electronics Engineer (IEEE) Standards
- International Mechanical Code
- International Telecommunication Union (ITU) Requirements
- ISO 9001 Quality Management Systems 2008
- Orndorff, Z. and W. Lee Daniels, “Final Contract Report: Delineation and Management of Sulfidic Materials in Virginia Highway Corridors,” Department of Crop and Soil Environmental Sciences, Virginia Polytechnic Institute and State University, September, 2002.
- National Electric Code (“NEC”)
- National Electric Safety Code (NESC) Standards
- National Electrical Manufacturers Association (NEMA) Standards
- National Transportation Communications for ITS Protocol (NTCIP)
- NFPA 70 National Electrical Code, 2011 Edition
- Society for Protective Coatings (SSPC) Standards
- Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) Standards and Specifications
- U.S. Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900
- Underwriters Laboratories (UL) Standards

- Virginia Calibration Methods, October 2008
- Virginia State Noise Abatement Policy, July 13, 2011
- Virginia, Erosion and Sediment Control Law and Regulations
- Virginia SWM Law dated 2015(as listed in the Code of Virginia)
- Virginia SWM Regulations dated 2015 (as listed in the Virginia Administrative Code)
- Virginia Test Methods Manual, June 2010
- Virginia Uniform Statewide Building Code
- VDOT Land Use Permit Regulations Guidance Manual, Revised November 8, 2011
- VDOT CII/SSI Policy Guide For Employees, Vendors, Contractor or other Persons Accessing VDOT’s CII/SSI – March, 2006 (Interim Revision November, 2009)
- VDOT Clearance Chart (08-18-03)
- VDOT Conductor Cable and Conduit Sizes (08-18-03)
- VDOT DBE Program, March 15, 2007
- VDOT ITS Projects – Systems Engineering and Architecture Compliance (Rule 940) Checklist
- VDOT Northern Region Operations ITS Architecture
- VDOT Public Involvement Manual, revised November 26, 2012
- VDOT NRO Vehicle Detector Master Plan, June 13, 2008
- VDOT NRO CCTV Master Plan, May 2008
- VDOT NRO CCTV Concept of Operations, May 2008
- VDOT NRO Vehicle Detector Concept of Operations, May 14, 2008
- VDOT Virginia Megaprojects Program Lane Closure Policy and Procedures, April 23, 2012

(c) Special Provisions List, Special Provision Copied Notes and Supplemental Specifications

Federal:

- c100ai03 General Project Requirements, Supplemental Specifications (SSs), Special Provisions (SPs) and Special Provision Copied Notes (SPCNs), 12-1-2011 (SPCN)
- S100B00 Project Communication and Decision Making for Design-Build Projects, January 3, 2005c, Reissued August 2009
- SS51202 Supplemental Section 512—Maintaining Traffic Design-Build Projects, December 2, 2009

Environmental:

- S107E02-0910 Volatile Organic Compounds (“VOC”) Emissions Control Areas, August 12, 2010

Geotechnical/Materials:

- S302B00-0708 Restoring Existing Pavement, January 14, 2008c
- S404B00-0708 Special Provision for Concrete Surface Color Coating

- SPCN c109g02-1209 Polymer Modified (PG 76-22 and PG 70-28) Asphalt Cement Adjustment, November 1, 2009
- SPCN c211gg0-0609 Section 211 Warm Mix Asphalt Pavement
- SPCN c248fg0-0708 Surface and Intermediate Mixes using Rap, January 14, 2008
- SPCN c315gg0-0609 Section 315 Warm Mix Asphalt Pavement
- Special Provision for Use of Domestic Material – February 26, 2009 (S102CF1)
- Special Provision for Design-Build Tracking (“DBT”) Numbers, June 4, 2015
- Special Provision for Hydraulic Cement, January 28, 2008
- Special Provision for Hydraulic Cement Concrete Admixtures, January 28, 2008
- SS21706 Hydraulic Cement Concrete, July 29, 2013
- SS40402 Hydraulic Cement Concrete Operations, December 17, 2010
- Special Provision for Jack and Bore for DB Projects, October 13, 2009
- Special Provision for Lime Modification of Soils, revised November 23, 2009
- Special Provision for Low Permeability Concretes For Design-Build Projects, September 6, 2009
- Special Provision for Planing Asphalt Concrete Pavement, December 2010
- Special Provision for Section 315 – Asphalt Concrete Pavement, November 25, 2009
- Special Provision for Section 317 – Stone Matrix Asphalt Concrete Placement, December 2, 2014
- Supplemental Specification – Section 248 — Stone Matrix Asphalt Concrete, April 1, 2012
- Supplemental Section 211—Asphalt Concrete, December 18, 2012
- Supplemental Section 515—Planing Or Milling Pavement, September 27, 2011
- C211hg0-1209 SPCN -Polishing Aggregate In Asphalt Concrete - Section 211—Asphalt Concrete, October 7, 2009
- Special Provision for Cold Planing (Milling) Asphalt Concrete Operations, September 27, 2011
- Supplemental Section 200—General, September 28, 2012
- Supplemental Section 207— Select Material, February 19, 2014
- Supplemental Section 208— Subbase and Aggregate Base Material, February 19, 2014
- Supplemental Section 303 – Earthwork, May 20, 2011c
- Special Provision for Micro Tunneling for Design Build Projects, September 14, 2009
- Special Provision for Crushed Hydraulic Cement Concrete January 14, 2008
- Special provision for Crushed Hydraulic Cement Concrete as Subbase and Aggregate base Material, October 1, 2015
- Special Provision for Elastic Inclusion for Design Build Projects, November 24, 2009
- Special provision for Needle-Punched, Non-Woven Geotextile Stabilization Fabric, October 1, 2015
- SPCN Crushed Glass, January 17, 2008
- Special Provision for Section 02768 - Hydraulic Cement Concrete Stamped, Colored & Reinforced, September 16, 2013

- Supplemental Section 212—Joint Materials, June 28, 2011
- Supplemental Specifications, Sec. 2.1.1 (c) – Soil Design Parameters for Sound Barrier Walls, Retaining Walls and Non-Critical Slopes, April 14, 2011
- Virginia Department of Transportation Special Provision for Sawing and Sealing Joints in Asphalt Overlays Over Jointed Concrete Pavements – October 31, 2008a
- Virginia Department of Transportation Special Provision for Density Control of Embankments and Backfill, Revised – November 26, 2006
- Virginia Department of Transportation Special Provision for Sealing Cracks in Asphalt Concrete Pavement or Hydraulic Cement Concrete Pavements (Prior to Overlay) – October 19, 2014
- Virginia Department of Transportation Special Provision for Undersealing Portland Cement Concrete Pavement – January 3, 1995
- Virginia Department of Transportation Special Provision for Low Density Cementitious Fill – June 24, 2011
- Virginia Department of Transportation Special Provision for Reflection Cracking Retardant Material (English Units) – March 22, 2010
- Special Provision Copied Note Section 515 – Planing Or Milling Pavement – October 8, 2015

Roadway/Drainage:

- SPCN c302h00-0708 Precast Drainage Structures, January 14, 2008
- Special Provision for Flowable Backfill, March 11, 2010
- Special Provision for Right of Way Monumentation and Final Boundary Stakeout, December 2, 2009a
- S107G01-0309 Storm Water Pollution Prevention Plan (“SWPPP”) General Permit for the Discharge of Storm water from Construction Activities Contractor and Subcontractor Certification Statement, February 19, 2009
- Special Provision for SWPPP General Information Sheets, September 3, 2014
- SPCN c107j12-1215 VPDES Construction Permits, October 26, 2015
- Special Provision for VPDES Construction Activities, October 26, 2015
- Special Provision for Section 244 – Roadside Development Materials, August 29, 2008
- Special Provision for Pipe Replacement, February 28, 2013
- Special Provision for Pipe Rehabilitation, July 30, 2015
- SS22101 – Supp. Sec. 221 – Guardrail – January 6, 2012

Structure & Bridge:

- Special Provision for Architectural Finish, Concrete Form Liners And Color Stain Coating, May 2, 2013
- Special Provision for Drilled Shafts Using Self-Consolidating Concrete for Design-Build and PPTA Contracts, April 15, 2013.
- Special Provision for Sound Barrier Walls/Architectural Finishes, February 18, 2016
- Special Provision for Concrete Surface Color Coating, July 2008

- SS40102-0912 Supplemental section 401—Structure Excavation April 17, 2012c
- SS22601-0609 Supplemental Section 226 - Structural Steel
- SS40603-0714 Supplemental Section 406 - Reinforcing Steel
- SS21402-0908 Special Provision - Hydraulic Cement
- SS21501-0908 Special Provision - Hydraulic Cement Concrete Admixtures
- SS21706-0214 Special Provision - Hydraulic Cement Concrete
- SS40404-0714 Special Provision - Hydraulic Cement Concrete Operations
- SS500A00-0708 Special Provision for Removal or Connection of Asbestos Pipe
- Virginia Department of Transportation Special Provision for Soldier Pile Retaining Walls – June 6, 2011
- Virginia Department of Transportation Special Provision for Hydraulic Cement Concrete Operations for Massive Construction – March 3, 2010
- Virginia Department of Transportation Special Provision for Asbestos Removal for Road Construction Demolition Projects – March 18, 2009
- Virginia Department of Transportation Special Provision for Design-Build Tracking (DBT) Numbers – February 8, 2008
- Virginia Department of Transportation Special Provision for Shotcrete and Permanent Concrete Facing – June 6, 2011
- Virginia Department of Transportation Special Provision for Secant Pile or Tangent Pile (Drilled Shaft) Walls – June 8, 2011
- Virginia Department of Transportation Special Provision for Permanent Soil Nails – June 7, 2011
- Virginia Department of Transportation Special Provisions for Mechanically Stabilized Earth Walls With Low Density Cementitious Fill (LDCF) – June 24, 2011
- Virginia Department of Transportation Special Provision for Densified Aggregate Piers for Foundation Reinforcement – June 24, 2011
- Special Provision for Mechanically Stabilized Earth Walls (Segmental Block Facing) for Design Build and PPTA Projects, December 17, 2012
- Special Provision for Mechanically Stabilized Earth Walls (Concrete Panel Facing) for Design Build and PPTA Projects, December 17, 2012
- Special Provision for MSE Walls (Modular Cantilever Facing), December 10, 2009
- Special Provision for Structure Demolition for Design Build and PPTA Projects, January 7, 2010
- Special Provision for T-Wall Retaining Wall System for Design-Build and PPTA Contracts, December 10, 2009
- Special Provision for Asbestos-Containing Soil, February 2, 2000
- Special Provision for Asbestos Removal And Neshap-Related Demolition Requirements For Structures On Design-Build Projects, June 22, 2009
- Special Provision for Corrosion Resistant Reinforcing Steel, January 24, 2012

Traffic Engineering:

- S704E02-1211 Type B, Class VI Pavement Line Marking, October 21, 2011
- S704F01-1209 Transitory Pavement Markers (“TPM”), December 12, 2009
- SPCN Locating, Removing and Disposing of Recessed Pavement Markers and Raised Snow-Plowable Markers, October 17, 2010
- SPCN Uniformed Flaggers, September 29, 2008a
- Special Provision for CG-12 Detectable Warning Surface, July 2008
- Special Provision for Emergency Preemption Equipment, August 10, 2010
- Special Provision for Preformed Thermoplastic Pavement Markings, November 29, 2011b
- Special Provision for Replacement of Pavement Line Markings, Pavement Markers and Loop Detectors, September 27, 2011
- Special Provision for Square Tube Steel Sign Post, March 3, 2008
- Special Provision for Temporary Construction and Permanent Pavement Markings, November 8, 2011
- Supplemental Section 703 – Traffic Signals, January 6, 2009
- Supplemental Section 701 – Traffic Signs, January 22, 2009c
- SPCN for Section 700.04 – Anchor Bolts, February 21, 2013
- SPCN for Section 700.04 – Concrete Foundations, April 2, 2004
- Special Provision For Signal Poles (Mast Arm Poles), August 1, 2012
- SS23401—Supp. Sec. 234 – Glass Beads For Reflect. Traff. Markings – October 16, 2014
- SS23802—Supp. Sec. 238 – Electrical & Signal Components – March 4, 2008
- SS24701—Supp. Sec. 247 – Reflective Sheeting – February 10, 2011
- S704E02 – Type B, Class VI Pavement Line Marking Tape – October 21, 2011
- SS70402—Supp. Sec. 704 – Pavement Markings & Markers 4-15-15
- Preformed Thermoplastic Pavement Markings 11-29-11b

Intelligent Transportation Systems:

- Special Provision for VDOT Intelligent Transportation Systems - Shoulder Lane Monitoring, March 23, 2012
- Special Provision for VDOT Intelligent Transportation Systems - Environmental Sensor Stations, August 26, 2013
- Special Provision for VDOT Intelligent Transportation Systems - Conduit, September 6, 2013
- Special Provision for VDOT Intelligent Transportation Systems - Ethernet Terminal Server, August 26, 2013
- Special Provision for VDOT Intelligent Transportation Systems – Junction Boxes, August 26, 2013
- Special Provision for VDOT Intelligent Transportation Systems – Video Detection, June 23, 2010

- Special Provision for Light Emitting Diode (LED) Roadway Luminaires – July 23, 2015 I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 238 – Electrical and Signal Components, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 510 – Relocating or Modifying Existing Miscellaneous Items, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 700 – General, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 703 – Traffic Signals, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 801 – Wiring and Surge Protection, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 802 – Reversible Roadway Gates, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 803 – Camera System, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 804 – Dynamic Message Signs, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 805 – Ethernet Switches, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 806 – Uninterruptible Power Supply, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 806 – Fiber Optic Communication, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 807 – Generator Assemblies, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 810 – Cabinet Assemblies, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 811 – Communication System Testing, February 17, 2016
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 813 – Dedicated Dynamic Message Signs, February 17, 2016

General Conditions:

- Special Provision for Field Office, November 24, 2009
- Special Provision for Section 105.02 – Plans and Working Drawings (Contract Management Software®), June 13, 2007
- I-95 Express Lanes Southern Terminus Extension Project Special Provision for Section 105 – Control of Work, February 17, 2016 (See I-95 Express Lanes STE Project SP package in ITS section)
- Special Provision for Section 301 – Clearing and Grubbing, November 15, 2006
- Special Provision for Work Zone Traffic Control Management for Design-Build, revised November, 2009

- SS52200 Supplemental Section 522—Partnering Design-Build Projects, revised June 1, 2012
- Special Provision for Construction Noise Control – June 28, 2007

The above list of Special Provisions is not intended to be an all-inclusive list. The Design-Builder is responsible for achieving the Work in accordance with all current VDOT standards as of the date of the RFP issuance, including any revisions and/or addenda thereof. If a construction element is not adequately addressed within VDOT Standard Specifications or the Special Provisions listed for the purpose of the Design-Builder's design, it is the responsibility of the Design-Builder to develop an alternative specification that is acceptable to VDOT for that element of work.

In the event of a discrepancy between VDOT and non-VDOT Standards and References listed herein, the VDOT Road and Bridge Specifications, design standards, and manuals shall take precedence, with the following exception. If AASHTO or the MUTCD require that a higher or better standard be applied, then AASHTO and/or the MUTCD shall take precedence. In accordance with Part 2, Section 2.1.3 below, all deviations from AASHTO minimum specified design values shall be documented, justified, and approved by VDOT and FHWA.

Special Provisions included in this contract document or other Special Provisions approved by VDOT shall govern over the VDOT specifications, design standards and manuals. Special Provision Copied Notes approved by VDOT and requirements specified within the text of this RFP shall govern over both the Special Provisions and VDOT specifications, design standards and manuals. I-95 Express Lanes Southern Terminus Extension Project Special Provisions shall govern over VDOT Special Provisions and the VDOT specifications, design standards, and manuals.

### **2.1.2 RFP Information Package**

An RFP Information Package will be provided to the point of contact for each short listed firm. The documents in the RFP Information Package are provided for information only. The Design-Builder shall verify information as needed. The RFP Information Package includes the following:

- Special Provisions, Special Provision Copied Notes, and Supplemental Specifications listed in Part 2, Section 2.1.1(c) above.
- ITS and Electrical Special Provisions and Specifications (Additional written requirements obtained from the 95 Express Lanes Concessionaire), dated February 17, 2016.
- RFP Conceptual Roadway and Drainage Plans, Revised, March 21, 2016
- RFP Conceptual ITS and Lighting Plan
- RFP Conceptual Signing and Pavement Marking Plan, Revised, March 21, 2016
- RFP Conceptual Erosion and Sediment Control Plan, Revised, March 21, 2016
- RFP Conceptual Front End Sheets

- Survey information as indicated in Part 2, Section 2.5.
- Sub-surface Utility information, South of the Garrisonville Road overpass, Revised, March 10, 2016
- Design Waivers as listed in Part 2, Section 2.1.3.
- Geotechnical Data Report (for roadway and soundwall), dated January 26, 2016.
- gINT files related to Geotechnical Data Report
- NEPA Document Re-evaluation, dated March 2016.
- Preliminary Environmental Document Re-evaluation for Plans, Specifications, and Estimates (PS&E) Authorization, dated March 2016.
- Preliminary Environmental Certification/Commitments Checklist, dated March 2016.
- Preliminary VDOT Permit Determination, dated March 2016.
- Preliminary Fish, Plant, and Wildlife Resources Clearance, dated March 2016.
- Air Quality Analysis Report, dated September 2011, along with follow-up clearance.
- I-95 HOT Lanes Project Preliminary Noise Analysis Final Report, dated August 2011.
- Southern Extension – I-95 HOT Lanes Acoustic Bat Survey and Habitat Evaluation, dated July 30, 2015.
- I-95 Express Lanes Southern Terminus Extension Traffic Operations and Safety Report, dated February 16, 2016.
- Architecture 940 Conformance Checklist.
- Approved Certification Request Form for use of Proprietary Products, dated February 9, 2016.
- Sample shop drawing for Type 1 DMS sign and walkway.

Requirements described in the Technical Information and Requirements (Part 2 of the RFP) shall supersede the information contained in the RFP Information Package, including the information depicted in the RFP Conceptual Plans. In the event that there is a discrepancy between the RFP Conceptual Plans (or other information contained in the RFP Information Package) and the Technical Information and Requirements (Part 2 of the RFP) herein, the Technical Information and Requirements (Part 2) shall take precedence.

Supplemental information which is not deemed a component of the RFP can be provided to the Offerors upon request. Supplemental information includes previously developed as-built plans and shop drawings. These documents are solely for the information of the Offeror, which each Offeror may use at their own risk and as they deem appropriate. The Department does not represent or warrant that the information contained in the documents is suitable for designing the Project.

Previously developed incomplete plans and studies for this Project, which are not deemed a component of the RFP, can be provided to Offerors upon request. These documents are solely for the information of the Offeror, which each Offeror may use at their own risk and as they deem appropriate. The Department does not represent or warrant that the information contained in the documents is suitable for designing the Project. Offerors interested in obtaining the

previously developed documents should contact the Design-Build POC specified in Part 1, Section 2.4.

### **2.1.3 Design Exceptions and Design Waivers**

Design Exceptions will be required for any element of the design among the fourteen controlling criteria that do not meet AASHTO minimum design standards. Design Waivers will be required for any element that meets AASHTO minimum design standards, but does not meet VDOT minimum standards or for any element other than the fourteen controlling criteria that do not meet AASHTO minimum design standards. The Design-Builder will be required to follow the process as described in the latest version of IIM LD-227, S&B 70 regarding Design Exceptions and Design Waivers.

VDOT has obtained the following design waivers, with respect to the RFP Conceptual Plans:

- Design Waiver Number 1 – Use of alternative shoulder pavement design and revised MC-4 requirements along 95 Express Lanes
- Design Waiver Number 2 – Use of 12-foot ramp lane width, 2-foot paved/4-foot total shoulder width, and revised GS-11 requirements along 95 Express Lanes
- Design Waiver Number 3 – Use of 10-foot paved/12-foot total left shoulder width and revised MC-4 requirements along I-95 GP Lanes

There are no anticipated design exceptions reflected in the RFP Conceptual Plans. However if during further development of the design the Design-Builder identifies the need for design exceptions or additional design waivers, the Design-Builder is required to either eliminate them through design improvements or apply for the appropriate design exceptions and/or waivers. The costs for preparation of design waivers or exceptions and any information needed to support these documents is the responsibility of the Design-Builder. Any schedule delays as a result of the approval process are the responsibility of the Design-Builder.

## **2.2 Mainline and Other Roadway Improvements**

The roadway inventory information and major design criteria are summarized in Attachment 2.2. The information contained in the Attachment shall serve as a basis for the Design-Builder to determine the appropriate criteria to apply to the design of the interstate, interchange ramps, and roadways. Offerors are on notice that the entirety of the information contained in the Design Criteria Table and Part 2, Section 2.2 of this document including but not limited to the design criteria, and other notes and data, contain the minimum roadway geometric design requirements that the Design-Builder shall meet in its performance of the Work. By submitting its Proposal, Offeror certifies that the Project Concept presented in its Proposal is fully compliant with such minimum requirements. Unless otherwise approved by VDOT, no changes to or deviation from the listed criteria shall be allowed. Any schedule delays as a result of changes or deviations are the responsibility of the Design-Builder.

The Design-Builder is responsible for making the necessary improvements to the I-95 general purpose lanes and the 95 Express Lanes depicted on the RFP Conceptual Plans (contained in the RFP Information Package). The Design-Builder shall not reduce the length of the project limits or reduce the widths of the proposed pavement types from the design shown on the RFP Conceptual Plans. The Design-Builder shall reconstruct the existing emergency crossover at Station 2261+50. The Design-Builder shall close and demolish the existing emergency crossover at Station 2226+25.

### Functional Classification

Interstate 95 and 95 Express Lanes are functionally classified as Rural Freeways. The VDOT geometric design standard that will be utilized for Interstate 95 and 95 Express Lanes will be GS-1 in rolling terrain with a minimum design speed of 70 mph.

The proposed 95 Express Lanes entrance, exit, and reversible lanes as shown on the RFP Conceptual Plans are functionally classified as Interchange Ramps. The VDOT geometric design standard that will be utilized for 95 Express Lanes ramps will be GS-R in rolling terrain. The southbound and reversible ramps shall be designed with a minimum design speed of 70 mph and the northbound ramp shall be designed with a minimum design speed of 50 mph. These lanes shall be constructed as 16-foot minimum width full strength travel lane pavement and 6-foot minimum width reduced strength shoulder pavement as shown in the RFP Conceptual Plans and as defined in Part 2, Section 2.6.1.

## **2.3 Structures and Bridges**

### **2.3.1 General**

Existing bridges on Route 610 over I-95 are located within the project limits. The Bridge Number of the EBL existing bridge is 6057 and Plan Numbers are 260-70, 260-70A, 260-70B and 260-70C. The Bridge Number of the WBL existing bridge is 6070 and Plan Number is 266-73.

Existing bridge class culvert Number 2009 is located within the project limits.

Existing bridge piers shall be evaluated in accordance with the requirements of the Manual of the Structure and Bridge Division Volume V Part 2, Chapter 15, File Number 15.06-1, AASHTO LRFD Bridge Design Specifications 7<sup>th</sup> Edition, 2014; and VDOT Modifications and the following:

- For the purpose of the Section C3.6.5.1 of AASHTO LRFD, assume that the twin bridges on Rte. 610 over I-95 are critical bridges and that  $AF_{HBP}$  is greater than 0.0001.
- Vertical and horizontal clearances under the existing bridge shall be in accordance with the requirements of the Manual of the Structure and Bridge Division Volume V Part 2, Chapter 6.

New bridge title sheets shall be submitted to show the new lane and shoulder configuration under the existing bridge and shall be prepared in accordance with the Structure and Bridge Division Volume V Part 2, Chapter 2.

Sound barrier posts shall be designed such that the minimum unbraced length is not less than the full height of the post, measured from the top of foundation to the free end of the post.

Sound wall posts shall not be spliced to soldier piles of retaining wall posts unless connection details are approved by the Department.

The Design-Builder shall provide a minimum of 30 days to VDOT to undertake verification and documentation of final as-built vertical and horizontal clearances under the existing bridges.

No traffic signs shall be attached to the existing bridge.

Details and drawings not specifically included in the Manual of the Structure and Bridge Division Volume V Series may only be included in the structural plans and working drawings after review and approval by The Department. Should any such details not be acceptable, the Design-Builder shall make the necessary modifications or shall submit an alternate detail that is acceptable to the Department.

### **2.3.2 Superstructure**

Section not applicable to this project.

### **2.3.3 Substructure**

Section not applicable to this project.

### **2.3.4 Miscellaneous**

Section not applicable to this project.

### **2.3.5 Structure Load Ratings**

Section not applicable to this project.

### **2.3.6 Working Drawings**

The Design-Builder shall review and approve working/shop drawings and submit three approved sets to VDOT for each structure. Reference should be made to Article 105.10 of Part 5 of the RFP. The working/shop drawings shall be approved by a registered, licensed, Professional Engineer in the Commonwealth of Virginia.

### **2.3.7 FHWA Bridge Construction Unit Cost Report**

Section not applicable to this project.

### **2.3.8 Safety and Acceptance Inspection for the Proposed Structures**

Section not applicable to this project.

### **2.3.9 Additional Bridge Design Criteria**

Section not applicable to this project.

### **2.3.10 Railroad Crossing**

Section not applicable to this project.

### **2.3.11 Retaining Walls**

#### **2.3.11.1 General Requirements**

The retaining walls shall be designed using AASHTO LRFD Bridge Design Specifications; Interim Specifications; VDOT Modifications (IIM S&B-80 VDOT Modifications to AASHTO LRFD Bridge Design Specifications); The Manual of Structure and Bridge Division Volume V Part 11 Chapter 10 Earth Retaining Structures; and applicable sections of VDOT's Road & Bridge Standards, Vol. I & II and as specified in the Technical Requirements.

Should any standard for retaining walls not be in accordance with AASHTO LRFD, then the Design-Builder shall verify design and/or implement a modified version of the requirement such that it is in compliance with AASHTO LRFD.

Retaining walls at bridge abutments shall be designed for a minimum service life of 100 years.

Except for tie-backs required for the support of retaining walls, all components of the retaining walls shall be contained within the Department's right-of-way. Tie-backs for retaining walls may be located within permanent underground easements provided that such easements are approved by the Department.

MSE walls that require traffic protection at the top shall utilize barriers or railings on moment slabs.

Parapets located on top of MSE walls shall utilize low permeability concrete in accordance with current VDOT Specifications.

For maintenance of the area at the top of a tall wall, a VDOT standard HR-1 shall be required when all the following conditions exist:

- A possible fall will be 4 feet or more.
- Maintenance will be performed on the area at the top.

Existing or new retaining walls shall be analyzed or designed for any additional loads imposed by sign structure supports or other structures.

Mechanically stabilized earth (MSE) walls shall be selected from VDOT's fully approved panel MSE wall systems (for which special provisions are included in the RFP Information Package).

Parapets located on top of MSE walls shall utilize low permeability concrete in accordance with current VDOT Specifications.

### **2.3.11.2 Plan Submission**

The Design-Builder shall submit a preliminary plan for each new or modified retaining wall. The Design-Builder shall not submit any final plans until the preliminary wall submittal has been approved by the Department. Final design efforts prior to the Department's preliminary plan approval shall be at the risk of the Design-Builder.

A retaining wall preliminary plan submittal shall include:

- A plan and elevation view of the wall showing all existing and proposed design features associated with the project and including existing and future utilities, sound walls, sign structures, landscaping, irrigation systems, barriers, existing and proposed drainage structures, adjacent bridges etc.
- A preliminary geotechnical report completed in accordance with the requirements of Part 2, Section 2.6 Geotechnical.
- Where applicable, approval of the preliminary wall submittal shall be subject to the approval of an H&HA study and scour analysis.

Where retaining walls are located at bridge abutments, retaining wall plans, including preliminary plans shall be included in a bridge plan submittal.

### **2.3.12 Traffic Structures**

In addition to Part 2, Section 2.9, the requirements of the section herein shall apply.

#### **2.3.12.1 Existing Traffic Structures**

The Design-Builder may reuse an existing traffic structure for proposed signs and ITS devices upon the submittal of documents which shall include a condition assessment based on field inspection, a listing of repair items required to address existing defects, and certification that the structure meets all current sign structure design criteria and is fully compliant with the

Technical Information and Requirements and Special Provisions listed in Part 2, Section 2.1.1. Any existing structure that the Design-Builder proposes to reuse must also be certified for the identified loads, including a statement sealed by a Professional Engineer by the Commonwealth of Virginia that the reused structure is fully compliant with the Technical Information and Requirements and Special Provisions listed in Part 2, Section 2.1, including roadway. The Department Structure ID for any sign and ITS structure to be modified for reuse or to be removed shall be clearly shown on the plans.

The Department Structure ID for any existing sign may be obtained by contacting the Department Fredericksburg District Structure and Bridge Section. The Department Fredericksburg District Structure and Bridge Section shall be notified prior to the removal or relocation of any existing traffic structure.

### **2.3.12.2 Inspection of Traffic Structures**

Acceptance of new or modified sign and ITS structures will require an initial safety inspection. The purpose of an initial inspection is to verify compliance with the requirements of: Inspection and Maintenance; and IIM-S&B-82 *Traffic Structures* and to identify deficiencies, including incomplete work, and variances from approved plans and specifications and which must be rectified before the structure can be accepted.

The initial inspection will be performed by the Department. The Design-Builder shall provide the Department with Approved for Construction drawings and Working Drawings, including all revisions at least two weeks prior to scheduling the inspections.

During the initial inspection, data including but not limited to location, date completed, description, horizontal/vertical clearances, structure element description and condition and traffic safety features will be gathered.

The Design-Builder shall ensure that all structural elements are accessible for inspection of all structures. This requirement may dictate that the Design-Builder provide:

- Man-lifts, barges, remote operated vehicles, bucket trucks or other equipment necessary to inspect the structure and plans, personnel, and equipment to implement traffic control.

Upon completion of the initial inspection, the Department will submit an inspection report to the Design-Builder within 10 days of the inspection either recommending acceptance of the structure or identifying deficiencies, including incomplete work, which must be rectified before the structure can be accepted. If a structure is not accepted, the Design-Builder shall rectify the deficiencies and notify the Department in writing, certifying the deficiencies have been corrected. Within 5 days of receipt of such certification, the Department may require that a follow-up inspection be performed to verify that the deficiencies have been corrected or recommend in writing to the Design-Builder that the structure is acceptable without a further inspection.

The final acceptance of sign/ITS structures will occur when the initial inspection is completed and any necessary follow-up (verification) inspections are performed. The initial inspection may be accomplished through multiple inspections as long as it is coordinated with the Department.

## **2.4 Environmental**

### **2.4.1 Environmental Document**

FHWA has previously issued a NEPA decision for the Project. A copy of the Finding of No Significant Impact (FONSI)/Revised Environmental Assessment (EA) dated December 5, 2011, is included in the RFP Information Package. VDOT has prepared a re-evaluation of the original EA to verify that the 2011 FONSI decision remains valid. VDOT has also completed preliminary document re-evaluations for Plans, Specifications and Estimates (PS&E) Authorization (EQ-200) dated March 2016, and a preliminary Environmental Certification/Commitments Checklist (EQ-103) dated March 2016, which are included in the RFP Information Package. VDOT will complete a final document re-evaluation for PS&E Authorization (EQ-200) and final Environmental Certification/Commitments Checklist (EQ-103) prior to the VDOT Project Manager releasing the Project for construction. If the Project includes phased work packages, then final versions of these documents shall be completed prior to authorizing construction for each phase.

The Design-Builder shall carry out environmental commitments during design and construction, as applicable, as identified in the EA, the re-evaluation of the original EA, the PS&E Re-evaluation, and the Environmental Certification forms. All commitment compliance shall be supported by appropriate documentation, to be provided by the Design-Builder to VDOT.

Any changes in the scope or footprint of the established basic Project concept, proposed by the Design-Builder and acceptable to VDOT, may require additional environmental technical studies and analysis to be performed by the Design-Builder at their cost. The Design-Builder will be responsible for notifying VDOT of plan revisions, scope changes, and providing any necessary studies and other necessary information to support VDOT's completion and re-evaluation of the NEPA document. VDOT will be responsible for the coordination of any environmental documentation re-evaluation with FHWA. The Design-Builder shall then carry out any additional environmental commitments that result from such coordination at its sole expense and no additional cost and/or time delays to the Project.

The Design-Builder is solely responsible for any costs or schedule delays related to the permit acquisition, permit modifications, and NEPA document re-evaluations associated with Design-Builder's design changes and no time extensions will be granted. All costs associated with complying with these requirements shall be included in the Offeror's Price Proposal.

### **2.4.2 Cultural Resources**

VDOT, in consultation with the Virginia State Historic Preservation Officer (VA SHPO),

has determined that there are no historic properties present or affected by the project as proposed in the RFP Conceptual Plans.

Any changes to the design, alignment, right-of-way limits, or easements shown on the RFP Conceptual Plans may require review by VDOT and could require additional cultural resources studies and/or coordination with the VA SHPO. The Design-Builder is responsible for conducting all cultural resources studies necessitated by the proposed changes, while VDOT is responsible for coordinating both the studies and the proposed changes with the VA SHPO. The Design-Builder shall then carry out any additional cultural resources commitments that result from such coordination at its sole expense and at no additional cost to the Project.

### **2.4.3 Section 4(f) Resources**

There are no 4(f) resources used by the Project as proposed.

### **2.4.4 Water Quality Permits and Compensatory Mitigation**

The Design-Builder shall obtain all necessary environmental clearances, permits, and approvals required to accomplish the work as noted in Part 4 (General Conditions of Contract), Article 2.6. The Design-Builder will be responsible for performing necessary design and fieldwork to support the acquisition of necessary water quality permits independently and directly from the regulatory agencies. The Design-Builder will be the Permittee.

The Design-Builder will be responsible for verifying permit requirements prior to construction. Regulatory agencies will make the final determination as to which state/federal water quality permits will be required during coordination with the Design-Builder.

It is anticipated that VDOT will acquire the Corps of Engineers (COE), Special Programmatic General Permit (SPGP) prior to July 15, 2016, based on the conceptual plans. The SPGP may be transferred to the Design-Builder upon both the transferee and the permittee supplying the COE and the Virginia Department of Environmental Quality (VDEQ) with a written and signed, by all appropriate parties, request to make the transfer. Such transfer will not be effective until written approval has been granted by the COE or VDEQ. It shall be the Design-Builder's responsibility to initiate and complete the transfer, to ensure that all conditions for a successful transfer are met, and to account for the time to acquire and transfer the permit in the Design-Builder's schedule.

It is also anticipated that VDOT will acquire the Virginia Water Protection (VWP) permit prior to July 15, 2016, based on the conceptual plans. The VWP permit may be transferred to the Design-Builder upon notification to the Board of the transfer, along with a written agreement between the transferee and the permittee containing a specific date of the transfer. The written agreement shall also specify that the Design-Builder will become the responsible party for coverage and liability, including liability for compliance with the requirements of enforcement activities related to the permitted activity. It may take more than 15 days for the Board to take action. It shall be the Design-Builder's responsibility to initiate and complete the transfer, to

ensure that conditions for a successful transfer are met, and to account for the time to acquire and transfer the permit in the Design-Builder's schedule.

Although the Department anticipates acquiring both the SPGP and VWP permits prior to July 15, 2016 as outlined above, the Design-Builder will not be allowed to make any assertions of schedule delays in the impact areas due to the non-acquisition of the permits, unless the permits are not acquired by September 30, 2016.

The SPGP and VWP permits were based off of the conceptual plans. Any deviations that the Design-Builder makes to the project footprint or scope may render the permits invalid, or may require modifications to the permits. The Design-Builder will be fully responsible for any re-permitting or permit modifications that may be required for the project. Should re-permitting or permit modifications be required, then the Design-Builder shall conduct the preliminary field assessment including, but not limited to, wetland delineation, stream assessment, and permit impact sketches. The Design-Builder shall also determine the required sequencing methodology to limit Project impacts to wetland systems. The Design-Builder shall utilize this information to obtain required permits.

It is anticipated that VDOT would have obtained any wetland and stream credits necessary for the SPGP and VWP permits prior to NTP. The previously obtained credits were sufficient compensatory mitigation for the wetland and stream impacts as shown on the conceptual plans. If the Design-Builder makes any deviation to the project footprint or scope as shown on the conceptual plans, then the Design-Builder shall determine any additional wetland or stream mitigations that may be required. In this case, the Design-Builder shall provide the required additional compensatory mitigation. The Offeror shall account for all costs associated with water quality permit acquisition, as well as compensatory mitigation, in its Price Proposal.

The Design-Builder shall note that avoidance, minimization, and mitigation measures associated with permit acquisition will require close coordination between the Design-Builder and VDOT. If permit issuance is delayed or permits are denied, the Design-Builder will be responsible for any schedule delays and/or associated costs.

Should the Design-Builder propose design changes acceptable to VDOT, permitting requirements may also change; the Design-Builder remains responsible for obtaining all necessary water quality permits and permit modifications required by the regulatory agencies to accommodate the design changes.

The Design-Builder shall ensure that Project schedules accommodate any Special Provisions, Time of Year Restrictions (TOYR), and the duration of permit acquisition from the regulatory agencies. The Design-Builder shall be responsible for adhering to permit conditions and Special Provisions, as identified in the permit authorizations including but not limited to TOYR, avoidance and minimization recommendations, restoration of temporary impact areas, and countersinking culverts.

The Design-Builder shall be responsible for compliance with pre-construction, construction-related permit conditions, as well as post-construction monitoring if required by

regulatory agencies. This shall include costs associated with acquiring water quality permits and additional compensatory mitigation for the Project if needed.

The Design-Builder shall provide to the VDOT Project Manager copies of all permits, documentation, and correspondence with regulatory agencies. Construction activities shall not impact regulated areas within the Project limits until all applicable water quality permits have been issued to the Design-Builder. The Design-Builder shall not proceed with work covered by the water quality permits until the VDOT Project Manager releases the work in writing. The VDOT Project Manager may release a portion or all of such work not in jurisdictional areas, but may order a suspension of the same work after its release. The Design-Builder shall not be allowed to begin work that pre-determines the work required in the jurisdictional areas until the permits are secured.

After receiving the VDOT Project Manager's release of the work, the Design-Builder shall notify the VDOT Project Manager and the regulatory permitting agencies in writing fourteen (14) days prior to beginning work in the jurisdictional areas covered by the water quality permits.

The Design-Builder shall allow environmental compliance inspections by VDOT, and/or regulatory agencies as required by permits and/or to facilitate any interim compliance reviews/assessments.

At the conclusion of the Project, the Design-Builder shall notify the VDOT Project Manager and the regulatory permitting agencies in writing of the completion of the work in the jurisdictional areas covered by the water quality permits. At the completion of the Project, the Design-Builder is required to transfer any Virginia Marine Resources Commission (VMRC) permit back to VDOT.

The Design-Builder shall carry out any additional permit conditions/commitments that result from change in footprint and/or scope (assuming it is approved by VDOT) at its sole expense and no additional cost to the Project; additionally the Design-Builder will be responsible for any schedule delays and associated costs.

All permitted construction activities shall be identified as hold points in the Design-Builder's CPM Schedule.

#### **2.4.5 Threatened and Endangered Species**

A search of the U.S. Fish and Wildlife Service (USFWS) database for Information, Planning, and Conservation System (IPaC) was conducted and found potential habitat for Harperella (*Ptilimnium nodosum*), Bald Eagle (*Haliaeetus leucocephalus*), and Northern Long-eared Bat (*Myotis septentrionalis*). A field assessment for Harperella concluded no potential habitat within the project limits, and there are no documented Bald Eagle nests within 600 feet of the project limits. USFWS concurred with the results of the bat habitat evaluation and acoustic survey plan that the probability of the project study area supporting a viable population of northern long-eared bats is low and that this species is presumed absent. A copy of the Acoustic

Bat Survey and Habitat Evaluation, dated July 30, 2015, is included in the RFP Information Package. The Acoustic Bat Study is valid for three (3) years until July 30, 2018. A copy of VDOT's preliminary Fish, Plant, and Wildlife Resources Form dated March 2016 is also included in the RFP Information Package.

The Virginia Department of Game and Inland Fisheries (DGIF) approved guidance on February 16, 2016, regarding both the little brown and tri-colored bats, which will be listed as State-Endangered on April 1, 2016. According to DGIF, there are no known hibernacula within the project area. However, summer surveys may identify roost trees that could be subject to conservation measures, as described in [http://www.dgif.virginia.gov/wildlife/LBBA\\_TCBA\\_guidance.pdf](http://www.dgif.virginia.gov/wildlife/LBBA_TCBA_guidance.pdf), which could include a June 1 to July 31 Time of Year Restriction (TOYR) on tree removal. If tree removal is proposed within this TOYR, the Design-Builder shall be responsible for confirming with DGIF whether roost trees have been identified prior to proceeding with tree removal.

The Offeror shall be advised that new and updated T&E information is continually added to agency databases. The Design-Builder will be responsible for any subsequent coordination to obtain updated information, requirements, and clearances from environmental regulatory agencies that provide threatened and endangered species oversight. This additional T&E species coordination is also a standard component of the water quality permit acquisition process and may result in permit conditions for which the Design-Builder will be responsible. The Design-Builder is responsible for ensuring that all T&E species are correctly identified and impacts assessed, noting that more or less resources may be present than initially identified. Avoidance and minimization shall be implemented to the greatest extent possible. The Design-Builder shall provide to the VDOT Project Manager copies of all documentation and correspondence with regulatory agencies.

#### **2.4.6 Hazardous Materials**

It is not expected that hazardous materials and/or contamination is present within the Project area. However, if hazardous materials and/or contamination is found, the Design-Builder shall manage solid waste, hazardous waste, and hazardous materials in accordance with all applicable federal, state, and local environmental regulations and shall implement good housekeeping, waste minimization and pollution prevention practices.

For any non-hazardous waste, the Design-Builder shall have the signatory responsibility for the waste shipping manifest(s) and/or bill(s) of lading. For hazardous waste the Design-Builder shall be considered the co-generator and shall be responsible for preparing the hazardous waste shipping manifest(s) for the VDOT representative's signature and as otherwise consistent with the signatory requirement under Section 411 of the VDOT 2007 Road and Bridge Specifications.

The Design-Builder shall be responsible for the development of a Spill Prevention, Control, and Countermeasure Plan as required by regulation and for submission of any required plan to the VDOT Project Manager prior to start of construction. In the event of spills or releases of petroleum products and other hazardous liquids or solid materials, the Design-Builder

shall take immediate action to contain and eliminate the spill release, including the deployment of environmental protection measures to prevent the migration of the spill into the waters of the United States and of worker exposure protection measures. The Design-Builder shall notify the VDOT Project Manager immediately of all instances involving the spill, discharge, dumping or any other releases or discovery of hazardous materials into the environment and shall provide all required notifications and response actions.

The Offeror shall include in the Price Proposal all costs associated with complying with the above listed requirements.

The Design-Builder shall not acquire property or easements until any required Phase I Environmental Site Assessment is complete and approved. This shall represent a hold point in the Design-Builder's CPM Schedule.

#### **2.4.7 Air Quality**

The Project has been assessed for potential air quality impacts and conformity with all applicable Federal and state air quality regulations and requirements. The Air Quality Analysis Report, dated September 2011, along with the subsequent air quality clearance specifically for the Southern Terminus Extension Project which concluded that the September 2011 air study is still valid, are provided in the RFP Information Package. The Report identifies federal and state regulatory requirements that must be adhered to during construction of the project.

This Project is located within an area designated as being in attainment with all of the National Ambient Air Quality Standards (NAAQS). It is also located within a volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>) emission control area, so all reasonable precautions should be taken to limit the emissions of VOC and NO<sub>x</sub> during construction of the project. In addition, the following Virginia Department of Environmental Quality (VDEQ) air pollution regulations must be adhered to during the construction of this project: 9 VAC 5-130-10 et seq., Open Burning restrictions; 9 VAC 5-45-760 et seq., Cutback Asphalt restrictions; and 9 VAC 5-50-60 et seq., Fugitive Dust precautions. The Design-Builder will be required to adhere to the limitations outlined in the Special Provision for VOC Emissions Control Areas.

Construction activities will be performed in accordance with the VDOT 2007 Road and Bridge Specifications. The specifications conform to the State Implementation Plan and require compliance with all applicable local, state, and federal regulations.

#### **2.4.8 Noise Mitigation**

A qualitative preliminary noise evaluation to address the southern terminus extension was performed by VDOT and a more-detailed review shall be completed by the Design-Builder during final design. The qualitative preliminary evaluation determined the conclusions from the 2011 preliminary noise study are still valid. It was determined from the preliminary noise evaluation that mitigation measures are required for the Project. However, noise abatement measures that were found to be feasible and reasonable during the preliminary noise analysis may not be found to be feasible and reasonable during the final design noise analysis.

Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction. A copy of the report *I-95 HOT Lanes Project Preliminary Noise Analysis Final Report* dated August 2011 is included in the RFP Information Package.

A Final Noise Abatement Design Report (NADR) shall be submitted to VDOT for review and approval. The Final NADR, consisting of a re-analysis of all noise sensitive receptors identified in the project area, will be required to confirm that noise mitigation is required.

Noise wall (noted as CNE NN), as shown on the RFP Conceptual Plans and the Preliminary Noise Analysis, shall be utilized for Proposal preparation purposes. As shown in the Preliminary Noise Analysis, the length of wall CNE NN is estimated to be 4,410 linear feet at an assumed maximum height of 20 feet. Therefore, 88,200 square feet shall be assumed for purposes of preparing the Price Proposal, and will be considered as the base square footage in which potential adjustments will be made as outlined below. The 88,200 square feet will be considered as the total exposed noise absorption area (surface area of exposed wall and posts facing the roadway). Foundations, wall structural supports, and wall panel areas below finished grade shall not be included in the square footage calculations. A post-award Final NADR, consisting of a re-analysis of all noise sensitive receptors identified in the Project area, will be required to confirm if noise mitigation is required. Based on results of the final noise analysis, one of the following scenarios will occur:

- If the final noise analysis indicates additional noise wall square footage is required in excess of the Offeror's Proposal that's not due to changes in plan and profile as part of the Design-Builder's final design, VDOT shall compensate the Design-Builder for any additional square footage above what was proposed.
- If the final noise analysis indicates a reduction of noise wall square footage than that provided in the Offeror's Proposal regardless of any design changes, the Design-Builder shall credit VDOT for the amount of the reduction.
- If the final noise analysis warrants noise walls but some or all the walls are not desired by the public, the Design-Builder shall credit VDOT for the reduced square footage amount.
- If the final noise analysis does not warrant noise walls but walls are desired by the public, VDOT will compensate the Design-Builder for any additional walls above what was proposed pending funding availability.

If the results of the Final NADR dictate; the Design-Builder will provide permanent noise mitigation in compliance with the Virginia State Noise Abatement Policy, the Highway Traffic Noise Impact Analysis Guidance Manual (July 2015), FHWA, Highway Traffic Noise Analysis and Abatement Guidance (January 2011), the VDOT Noise Report Development and Guidance Document Version 5, Special Provision for Sound Barrier Walls, and the Soil Design Parameters for Sound Barrier Walls, Retaining Walls and Non-Critical Slopes, and the (updated January 2016) VDOT Road Design Manual.

The final barrier location(s) and dimension(s) will be determined during the final design noise analysis. A draft NADR shall be submitted for review and approved prior to the submittal of a final NADR. The NADR shall be conducted by an individual qualified in the field of highway traffic noise impact analysis as noted in Section 3.0 of the Highway Traffic Noise Analysis and Abatement Guidance Manual. The NADR shall be furnished by the Design-Builder at its sole cost and expense. The NADR will utilize environmental traffic data (ENTRADA) spreadsheets with the appropriate design year. The Offeror shall be responsible for developing the ENTRADA for the Final NADR based on the approved design and or latest design information.

Upon approval of the Final Design Noise Analysis the Department shall prepare a concurrence letter outlining the results of the analysis for the Department's Chief Engineer and FHWA. Once concurrence is achieved the Design-Builder shall prepare and mail letters "certified return receipt" to benefitted receptors to ascertain the desire to have noise barriers constructed as part of the Project. Upon completion of the citizen survey the Department shall prepare a second concurrence letter documenting the results, if necessary. All sound walls should be named as presented within the NADR.

All noise barriers recommended for construction and concurred with by the Chief Engineer and FHWA are included in the scope of the Construction Project. This includes barriers with conditions, as long as those conditions have been met.

Prior to submitting a sound wall plan for the Department's review, the Design-Builder will have the noise consultant that completed the NADR review the plan set and certify that the proposed design meets the noise abatement requirements. This certification will be included in the plan set when it is submitted to the Department for review.

If deviations in the horizontal or vertical alignment of a noise barrier (or the roadway alignment) are proposed following concurrence from the Chief Engineer or FHWA, then the Design-Builder shall perform any additional noise analysis and provide the results to the Department for review and approval prior to construction. This will include a plan and profile view of the roadway with the alignments recommended barrier and the proposed design. A justification of the deviation will be included with the plan set. The revised NADR chapter for the noise barrier for which modification is requested will be submitted with this additional information.

A key plan will be clearly labeled to show the location of the ground-mounted combo wall (sound wall on retaining wall) and bridge-mounted noise barriers.

Plan view will provide the alignment of the noise barrier with the roadway plan view.

Profiles of the wall alignment will include the noise attenuation line and the existing and proposed elevation. If combo walls or bridge-mounted barriers are present along the alignment, the pattern of the line will be different so that all lines can be distinguished.

Stations of the roadway and noise barrier will be included on both the plan and profile views.

Sound barrier walls shall be designed (location, grading, drainage, etc.) with a 10 foot wide maintenance area behind the walls with access for personnel and equipment. The maintenance area shall be clear of trees and dense vegetation. The back of the sound barrier wall shall be a minimum of 10 feet from the existing VDOT right of way line.

A minimum 3 foot wide bench of a slope of 4:1 or flatter shall be provided at the front and back of the sound wall to allow for inspection and maintenance access. The bench shall be sloped away from the wall.

The color, texture, and finish of all sound barrier walls constructed on the Project (both the roadway side and the back side) shall match the color, texture, and finish of the existing walls along I-95 just north of the Garrisonville Road overpass. The Design-Builder shall submit sample panel(s) for review and approval by the Department, prior to installation of sound barrier panels for the Project.

Noise wall CNE NN shall be designed to accommodate the earth pressure associated with the fill, pavement, and live loadings of the future auxiliary lane to be constructed by others. Additionally, positive drainage shall be provided along the soundwall. The bottom of wall profile along the front and back faces of the sound barrier wall shall be designed to accommodate a future auxiliary lane to be designed and constructed by others. The Design-Builder shall be responsible for constructing any additional embankment (up to finished grade) and retaining wall panels to accommodate the future auxiliary lane. Drainage ditches and inlets shall be set such that the auxiliary lane can be constructed without adjusting the locations or elevations of these drainage features.

Sound barrier walls shall be located a minimum of 37 feet from the Interstate 95 edge of the existing right travel lane. Minimum barrier system offsets to the noise barriers shall be 4 feet plus the dynamic deflection zone for the Design-Builder's selected barrier system, as specified in the VDOT Road Design Manual, Appendix I.

Access shall be provided via overlapping wall gaps and access doors for VDOT maintenance personnel. Four (4) overlapping wall gaps shall be provided reasonably close to the locations shown on the Conceptual Plans. Gaps shall be provided in the walls with a minimum 3:1 ratio of barrier overlap (gaps shall have a 10-foot minimum clear width). Additionally, any continuous wall lengths greater than 900 linear feet shall be provided with an access door at approximately half the distance of the continuous wall length. Sound barrier wall design shall also be coordinated with first responders to ensure access to fire hydrants and other emergency equipment.

Special Provision for Sound Barrier Walls / Architectural Finished, June 1, 2015.

Access doors will be determined prior to fabrication, with review and approval of VDOT maintenance staff.

Personnel access doors at locations shown on the plans shall have:

- A minimum inside frame dimension of 48-inches by 86-inches;
- Stainless steel hardware, industrial grade pull handle;
- A deadbolt lock with key on both sides;
- Open away from I-95;
- A minimum 4-ft by 4-ft 4-inch thick concrete pad on both sides of the door; and
- Match color and material for sound barrier wall doors north of Garrisonville Road.

#### **2.4.9 Environmental Compliance**

The Design-Builder is responsible for compliance with all applicable state and federal environmental laws, regulations, and permits. If, at any time, the Design-Builder is not in compliance with all applicable environmental laws, regulations, Executive Orders, commitments, etc., the VDOT Project Manager has the authority to suspend work, in whole or in part, until such time as the deficiencies or non-compliant items have been corrected. Should any non-compliant item(s) be identified during construction, immediate and continuous corrective action shall be taken by the Design-Builder to bring the item(s) back into compliance.

The Design-Builder shall be responsible for any schedule delays and associated costs as a result of any delays and/or shut downs associated with non-compliance. Any monetary fines associated with violations and/or any environmental restoration activities required to resolve violations shall be the responsibility of the Design-Builder.

The Design-Builder shall carry out environmental commitments during design and construction, as applicable, as identified in the EA, the re-evaluation of the original EA, PS&E Authorization (EQ-200), and the Environmental Certification/Commitments Checklist (EQ-103). All commitment compliance shall be supported by appropriate documentation, to be provided by the Design-Builder to the VDOT Project Manager.

The Design-Builder shall be responsible for compliance with pre-construction and construction-related environmental commitments and permit conditions. The Design-Builder shall assume all obligations and costs incurred by complying with the terms and conditions of the permits and certifications. Any fines associated with environmental permit or regulatory violations shall be the responsibility of the Design-Builder.

#### **2.5 Survey**

The Design-Builder is advised that the preliminary field survey and utility data provided with the RFP Information Package is not represented to be complete and/or accurate for purposes of design and construction of the Project.

The current aerial mapping product extends from 1600 feet north of Aquia Creek to Centreport Parkway to the south and approximately 800 feet from the center line of the travelway in both the east and west directions. The date of the original mapping is unknown, and was provided to a licensed survey consulting firm in May of 2011, in order to integrate mobile

LiDAR data into the product. Mobile LIDAR was performed and the additional data supplemented with the existing data, and was provided to 95 Express Lanes in early 2012. Storm as-built data (unknown date) is available from just north of the Garrisonville interchange, extending to the north terminus of the project. The mapping product does not appear to have been field rectified. Preliminary field survey and utility data have been obtained, including, but not limited to the following:

- Vertical control (Based on NAVD88 Geoid 1999)\*\*
- Horizontal control (Based on NAD83-1999)\*\*VDOT Project Coordinates
- Planometrics from fixed wing aerial mapping
- Storm drainage as-builts along some portions of the project
- R/W lines and limited property line information
- Utilities Level B sub-surface utility investigation South of the Garrisonville Road overpass
- TIN file

The Department will provide a new mapping product to the Design-Builder prior to the due date for the RFP Price Proposal. The new mapping product will supersede the current mapping product, and shall be considered when developing the final Price Proposal. The new mapping product will contain the following:

- Vertical control (Based on NAVD88 Geoid 2012A)
- Horizontal control (Based on NAD83-US Survey Foot)
- Planometrics from aerial LiDAR, low-level photogrammetry, and field shot topography
- Storm drainage as-builts along impacted areas
- VDOT right-of-way lines (but no property lines adjoining the right-of-way)
- Utilities Level B sub-surface utility investigation, South of the Garrisonville Road overpass
- Digital Terrain Model and TIN file

The Design-Builder's scope of work shall include performing all other surveying and utility designation that is necessary to design and construct the Project in accordance with VDOT's Survey Manual. The Design-Builder shall be responsible for obtaining any additional survey data, including all right-of-entry and land use permits, locating and/or designating underground utilities, digital terrain model (DTM), utility test holes and obtaining other related data necessary for the design, limited access revisions, and construction of the Project.

The Virginia Code 33.2-1011 requires that Notice of Intent letter "shall be sent to the owner by mail, at the address recorded in the tax records, **not less than 15 days prior to** the first date of the proposed entry. Notice of intent to enter shall be deemed made on the date of mailing." "The notice shall include the anticipated date such entry is proposed to be made and the purpose of such entry." Advance notification of property owners is required for all data collection efforts related to the development of highway plans. Copies of the letters and address

labels shall be provided to the VDOT Project Manager for forwarding to the District Survey Manager as soon as they become available for VDOT approval.

Additionally, the Design-Builder will be responsible for any update (property owner changes, subdivisions, etc.) that may occur; updates need to be reflected on the plans in order to acquire right of way and complete the final design. Any survey changes shall be verified and certified, and submitted in final documentation.

The Design-Builder will be responsible to reset or relocate any survey control damaged, destroyed or located within the footprint of the final design construction limits. The control will be established by a land surveyor licensed in the Commonwealth of Virginia with LD-200 information and supporting computations submitted to the Project Manager.

Prior to Project completion, the Design-Builder shall provide and set final VDOT RM-1 or RM-2 right of way monuments within the Project Limits. The Design-Builder shall depict the monuments on the Right of Way Plans in accordance with the Department's Survey Manual.

## **2.6 Geotechnical Work**

VDOT has completed a preliminary geotechnical subsurface investigation for this Project. The results of the investigation are presented in the Geotechnical Data Report dated January 26, 2016, which is included in the RFP Information Package.

The data included in this RFP is being provided for Offeror's information in accordance with Section 102.04 of Division I Amendments (Part 5). The Design-Builder shall perform a design-level geotechnical investigation to validate and augment the geotechnical information included in this RFP. The geotechnical engineering investigation performed by the Design-Builder shall meet or exceed both Chapter III of the VDOT Material Division's Manual of Instructions (MOI); the current AASHTO LRFD *Bridge Design Specifications*, 6<sup>th</sup> Edition, 2012 and VDOT Modifications; and Section 700.04 (c) of the VDOT 2007 Road and Bridge Specifications. Standard penetration test borings shall be performed for all trenchless crossings at both the launch and receiving pits and at no greater than 100-foot spacing along the alignment of the crossing to a minimum depth of 2 pipe diameters below the proposed invert for all crossings of 36-inch diameter or greater. A boring location plan showing all proposed explorations shall be approved by the Department prior to initiation of the final/design geotechnical investigation.

The Design-Builder shall collect appropriate data for geotechnical evaluation of pavements, embankments, soil and rock cuts, culverts, structures (retaining/mechanically stabilized earth, sound walls, storm water management facilities, traffic structures, minor structures including drainage pipes, and any other earth-supported or earth-retaining structures or elements of highway design and construction required for this Project.

The Design-Builder will be responsible for obtaining all necessary permits and utility clearances as required by VDOT, the Commonwealth of Virginia, or any other jurisdictional body or owner prior to accessing public or private property for the purpose of conducting geotechnical field work and shall provide the necessary traffic control in accordance with the

Work Area Protection Manual. The Design-Builder shall complete laboratory tests in accordance with pertinent ASTM or AASHTO standards and analyze the data to provide design and construction requirements. Soils, rock, aggregate, asphalt, concrete and other materials tests shall be performed by a laboratory accredited through the AASHTO Accreditation Program (AMRL and CCRL) for each test it conducts for the Project, unless otherwise approved by VDOT.

The Design-Builder shall provide VDOT with all records of subsurface explorations and describe the soils encountered and their depth limits in accordance with the requirements outlined in Chapter III of the VDOT Materials Division MOI. The Design-Builder shall provide to VDOT electronic copies of all subsurface explorations in accordance with the boring log template available on the website included in Chapter 3 of the VDOT Materials Division MOI. The electronic files shall be provided by a certified professional geologist or a suitably qualified registered professional engineer in the Commonwealth of Virginia, in gINT© software. The gINT© file for the borings contained in Geotechnical Engineering Data Report, dated January 26, 2016, are provided in the RFP Information Package.

Unless otherwise addressed by AASHTO LRFD, the Design-Builder shall incorporate reliability assessments in conjunction with standard analysis methods in accordance with Chapter III of the Materials MOI. An acceptable method for evaluation of reliability is given by Duncan, J.M. (April 2000) *Factors Of Safety and Reliability in Geotechnical Engineering*, Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Discussions and Closure August 2001. The Design-Builder may propose to identify specific, non-critical features, and alternative methods for evaluating variability of subsurface conditions, reliability and minimum factors of safety, prior to submission of its design calculations and drawings. VDOT may, in its sole discretion, accept or reject such proposed methods.

The Design-Builder shall submit to the VDOT for its review all geotechnical design and construction memoranda and/or reports that summarize pertinent subsurface investigations, tests, and geotechnical engineering evaluations and recommendations utilized in support of their design/construction documents. This submittal shall be made at least sixty (60) days in advance of the submittal of any final design/construction documents that are dependent upon the geotechnical evaluations and recommendations. Technical specifications for construction methods that are not adequately addressed in the Standard Specifications shall be provided by the Design-Builder as part of the final design/construction documentation. Prior to submittal of any final design/construction documentation, the Design-Builder shall review the final design/construction documents to assure that it appropriately incorporated the geotechnical components and shall submit evidence of this review to accompany the final design/construction documentation. The Design-Builder shall reference the drawings that incorporate the pertinent results. The Design-Builder's Quality Assurance and Quality Control (QA/QC) Plan shall document how each specific geotechnical recommendation or requirement will be addressed in the final design/construction documentation. The results of the geotechnical investigation and laboratory results shall support design and construction efforts to meet the requirements outlined in this Section.

### **2.6.1 Minimum Pavement Sections**

Minimum pavement sections and anticipated locations for these sections shall be utilized for Proposal preparation purposes only. The anticipated locations for new pavement and mill and overlay and the pavement sections are provided on the RFP Conceptual Plans included in the RFP Information Package. The Design-Builder shall be required to validate the minimum pavement sections and to notify the Department of its findings. If the Design-Builder's findings require a deviation from the RFP requirements, it shall notify VDOT during the Scope Validation Period consistent with Part 4, Section 2.2. Acceptable changes to the minimum pavement sections are limited to increasing the thickness of the base or subbase layers specified below. Any changes to the minimum pavement sections provided in this Part 2, Section 2.6.1 and/or location for the pavement sections shown on the RFP Conceptual Plans require approval by VDOT. The Design-Builder shall be responsible for the final design and construction of the pavements for this Project in accordance with the Contract Documents.

All travel lane and shoulder pavements shall be constructed or resurfaced in accordance with the pavement criteria below:

Facility	Minimum New Travel Lane Pavement Requirements	Minimum Existing Pavement Resurfacing Requirements	Minimum New Shoulder Pavement Requirements
Pavement Areas Adjacent to Existing I-95 GP Lanes (Southbound Sta. 2193+00.00 to 2221+12.43) (Northbound Sta. 3200+00.00 to 3229+62.56)	<ul style="list-style-type: none"> <li>• <b>Surface:</b> 2.0 inches of Asphalt Concrete Surface Course SM-12.5E</li> <li>• <b>Intermediate:</b> minimum 2.0 inches of Asphalt Concrete Intermediate Course IM-19.0A</li> <li>• <b>Base:</b> minimum 11.0 inches of Asphalt Concrete Base Course BM-25.0A</li> <li>• <b>Drainage:</b> 3.0 inches of Stabilized Open Graded Drainage Layer (OGDL)</li> <li>• <b>Subbase:</b> 6.0 inches of Cement Treated Aggregate (CTA)</li> </ul>	<ul style="list-style-type: none"> <li>• For use as a travel lane, existing shoulder pavement after proposed wedge and level must be resurfaced to the following depths and materials:                             <ul style="list-style-type: none"> <li>○ <b>Milling Existing Pavement:</b> minimum 4.0 inches</li> <li>○ <b>Surface:</b> 2.0 inches of Asphalt Concrete Surface Course SM-12.5E</li> <li>○ <b>Wedge and Leveling:</b> minimum 2.0 inches of Asphalt Concrete Intermediate Course IM-19.0A</li> </ul> </li> <li>• Where existing pavement markings and/or existing snow plowable raised pavement markers are to be eradicated and removed for temporary lane shifts, the existing pavement shall be milled and overlaid to the following depths and materials up to the nearest longitudinal lane divide:                             <ul style="list-style-type: none"> <li>○ <b>Milling Existing Pavement:</b> minimum 2.0 inches</li> <li>○ <b>Surface:</b> 2.0 inches of Asphalt Concrete Surface Course SM-12.5E</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Same as Minimum New Travel Lane Pavement Requirements</li> <li>• Paving adjacent to guardrail shall be in accordance with the Design Waivers listed in Section 2.1.3</li> </ul>

Facility	Minimum New Travel Lane Pavement Requirements	Minimum Existing Pavement Resurfacing Requirements	Minimum New Shoulder Pavement Requirements
95 Express Lanes Pavement Areas Not Adjacent to Existing I-95 GP Lanes (Southbound Sta. 2221+12.43 to 2232+59.00) (Northbound Sta. 3225+42.59 to 3233+39.99) (Reversible Sta. 2232+59.00 to 2310+83.74 and 82+92.43 to approx. 121+00)	<ul style="list-style-type: none"> <li>• <u>Minimum Width</u>: 16 feet</li> <li>• <u>Surface</u>: 2.0 inches of Asphalt Concrete Surface Course SM-12.5E</li> <li>• <u>Intermediate</u>: minimum 2.0 inches of Asphalt Concrete Intermediate Course IM-19.0A</li> <li>• <u>Base</u>: minimum 11.0 inches of Asphalt Concrete Base Course BM-25.0A</li> <li>• <u>Drainage</u>: 3.0 inches of Stabilized OGDL</li> <li>• <u>Subbase</u>: 6.0 inches of CTA</li> </ul>	<ul style="list-style-type: none"> <li>• Where existing pavement markings and/or existing snow plowable raised pavement markers that conflict with the proposed pavement marking design are to be eradicated and removed, or the pavement is part of the previously built stub-out behind existing concrete barrier and not currently subjected to traffic, the existing pavement shall be milled and overlaid to the following depths and materials up to the nearest longitudinal lane divide:                             <ul style="list-style-type: none"> <li>○ <u>Milling Existing Pavement</u>: minimum 2.0 inches</li> <li>○ <u>Surface</u>: 2.0 inches of Asphalt Concrete Surface Course SM-12.5E</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <u>Minimum Width</u>: 6 feet</li> <li>• <u>Surface</u>: 2.0 inches of Asphalt Concrete Surface Course SM-12.5E</li> <li>• <u>Intermediate</u>: minimum 2.0 inches of Asphalt Concrete Intermediate Course IM-19.0A</li> <li>• <u>Subbase</u>: 21.0 inches of Aggregate Base Material, Type 1, Size No. 21B</li> <li>• Paving adjacent to guardrail shall be in accordance with the Design Waivers listed in Section 2.1.3</li> </ul>
Emergency Crossover	The existing emergency crossover pavement shall be demolished and reconstructed to the following depths and materials: <ul style="list-style-type: none"> <li>• <u>Surface</u>: 2.0 inches of Asphalt Concrete Surface Course SM- 12.5E</li> <li>• <u>Intermediate</u>: 2.0 inches of Asphalt Concrete Intermediate Course IM-19.0A</li> <li>Subbase: 6.0 inches of Aggregate Base Material, Type 1, Size No. 21B</li> </ul>		

Widening of existing lanes shall provide for lateral drainage of the proposed pavement layers by providing OGDL connected to a standard UD-4 edgedrain placed beneath the outside edge of the paved shoulder. The OGDL and CTA layers shall be placed at a constant thickness over the entire width of the proposed widened travel way and shoulder pavements.

Widening of the existing GP lanes shall be accomplished by full depth saw cutting a minimum one (1) foot inside the existing edge of pavement. All pavement widening shall be performed in accordance with standard WP-2. All existing underdrains shall be removed and replaced beneath the outside edge of the new pavement, and all existing cross-drains shall be extended to daylight or connected to a storm drainage structure.

The minimum pavement sections shall be based upon the following criteria: (a) a minimum soil CBR value of 5 within 3 feet of subgrade (therefore all imported fill material used within 3 feet of subgrade shall have a minimum CBR value of 5), (b) all subgrade is compacted in accordance with the applicable sections of the Road and Bridge specifications and applicable special provisions and, (c) all unsuitable materials have been removed or modified in accordance with Section 2.6.3. Pavement designs shall be performed in accordance with AASHTO Design of Pavement Structures (1993) guidelines and Chapter VI of the Materials MOI (2011).

The minimum pavement sections require that proper grading be maintained to direct surface water away from paved areas and to provide for efficient runoff from surrounding areas. Any utility excavations or excavations for storm drains within pavement areas shall be backfilled with compacted structural fill in accordance with applicable sections of the VDOT 2007 Road and Bridge Specifications and applicable Special Provisions.

VDOT guidelines specify that edgedrains/underdrains be provided for all pavements with daily traffic volumes in excess of one thousand (1,000) vehicles per day. Therefore, standard UD-4 edgedrains shall be required for all pavements on this project. The OGD shall be connected to a standard UD-4 edgedrain placed beneath the outside edge of the paved shoulder. Standard UD-4 edgedrain shall not be placed under travel way pavement. Modified UD-1 underdrain shall be provided in lieu of standard UD-4 edgedrain for pavement sub-drainage in areas of high ground water, springs or cuts in excess of fifteen (15) feet; the modification consists of wrapping the aggregate with geotextile drainage fabric. Standard Combination Underdrain (CD-1) shall be provided at the lower end of cuts. Standard Combination Underdrain (CD-2) shall be provided at grade sags, bridge approaches, and at the lower end of undercut areas.

### **Temporary Pavement**

The Design-Builder shall be responsible for any temporary pavement design. Temporary pavements shall be designed in accordance with the AASHTO Guide for the Design of Pavement Structures (1993 edition) and the VDOT Materials Division's Manual of Instructions. All temporary pavement designs shall be submitted to VDOT for review. All temporary pavement shall be completely removed once it is no longer in service. All temporary pavement designs for interstate mainline or ramp pavements shall have a minimum 6 inches of asphalt concrete and shall meet the following minimum design criteria:

- Design Life – 6 months minimum
- Reliability – eighty-five percent (85%) minimum
- Initial Serviceability – 4.2 minimum
- Terminal Serviceability – 2.8 minimum
- Standard Deviation – 0.49 minimum
- CBR value for subgrade soils determined through laboratory tests

## 2.6.2 Geotechnical Requirements

Embankments, cut slopes, and certain aspects of retaining wall design are not addressed by LRFD. Embankments and cut slopes shall be designed in accordance with Section 305 of the VDOT Materials Division's MOI. Embankments and cut slopes shall be no steeper than 2H:1V unless supported by engineering analyses based on site specific field investigation and site specific laboratory strength testing. Slopes steeper than 2H:1V shall be approved by the Department. All embankments and cut slopes shall be designed to be stable for the interim construction stages, for the end-of-construction condition and for design-life conditions. The Design-Builder is responsible for verifying the stability of all slopes, including those retained by structures.

Problem soils such as Potomac Formation clays or silts shall be analyzed for short-and long-term stability using residual strength parameters determined from laboratory shear testing. These parameters shall be determined by drained direct shear tests using sufficient stress reversals to obtain large strains as discussed in the Corps of Engineers laboratory testing procedures EM-1110-2-1906. Many reversals are required to reach residual strengths and some references suggest using a pre-split sample (Ref. Engineering properties of Clay Shales, Report No. 1 by W. Haley and B.N. MacIver).

All retaining walls shall be designed in accordance with applicable VDOT and AASHTO requirements, including Soil Design Parameters for Sound Barrier Walls, Retaining Walls and Non-Critical Slopes included in the RFP Information Package. If the Design-Builder elects to use mechanically stabilized earth (MSE) walls, the fill material used in the reinforced zone shall be a crushed aggregate with properties in accordance with VDOT's Special Provisions for approved proprietary MSE walls. The Design-Builder shall provide both global and external stability analysis utilizing a computer program acceptable to VDOT and submit the results of the analysis, including boring logs, laboratory data, and any other applicable data, to VDOT geotechnical engineers for review. The wall supplier shall provide to the Design-Builder, for submittal to VDOT, an internal stability analysis that validates the design of the wall. Retaining walls shall be designed to control settlements within tolerances identified by VDOT Guidelines for Preparation of Alternate Retaining Wall Plans.

Material and Construction requirements shall follow VDOT Manual of the Structure and Bridge Division, Volume V – Part 11 “Geotechnical Manual for Structures” and applicable special provisions listed in Part 2, Section 2.1.1. Where undercutting and material replacement is required to reduce settlement or improve bearing capacity/global stability, areas requiring repair shall be clearly identified on the plans with notes provided to aid plan review, construction, and inspection.

## 2.6.3 Unsuitable Materials

Unsuitable Material is defined as material used as embankment fill, and in cut areas to a depth of at least three (3) feet below subgrade directly beneath pavements and at least two (2) feet beneath the bedding of minor structures and laterally at least two (2) feet beyond the outside edge of the pavement shoulders and bedding limits of the minor structures that meets one or

more of the following criteria: classifies as CH, MH, OH and OL in accordance with the Unified Soil Classification System (USCS); contains more than five (5) percent by weight organic matter; exhibits a swell greater than five (5) percent as determined from the California Bearing Ratio (CBR) test using VTM-8; exhibits strength, consolidation, durability of rock or any other characteristics that are deemed unsuitable by the Design-Builders' geotechnical engineer or as denoted in the Contract Documents for use in the Work. All materials within the uppermost three (3) feet of a pavement subgrade that exhibits a CBR value less than that stipulated in the pavement design shall also be considered unsuitable.

The anticipated locations and methods of treatment for unsuitable materials identified by the Design-Builder's qualified geotechnical engineer shall be shown on the design plans and cross sections. Acceptable methods of treating unsuitable soils are: a) complete removal from 2 feet beyond the outside edge of shoulder on each side of the pavement or bedding limits of minor structures and replacement with structural fill b) partial removal to *at least* 2 feet below final pavement subgrade or minor structure bedding elevation to within the limits noted in (a) and replacement with select fill and geosynthetic material c) raising grades with select fill and geosynthetic material to provide a *minimum* 2 feet of separation between these soils and final pavement subgrade or minor structure bedding d) chemical stabilization of the soils to a minimum depth of 12 inches below final pavement subgrade. Highly plastic clays or elastic silts may be used by compacting them in confined embankment fills and capping them with at least 2 feet of suitable subgrade fill material provided these fills are adequately engineered and constructed. Unsuitable materials and methods of treatment shall be identified on the plans and cross-sections as required by the Location and Design Division's Road Design Manual.

Saturated or very dry and/or loose or very soft coarse- and fine-grained soils that exhibit excessive pumping, weaving or rutting under the weight of construction equipment are also considered unsuitable unless they can be moisture conditioned through either mechanical or chemical means to an acceptable moisture content that allows adequate compaction to meet project specifications, and classification testing indicates they are not otherwise unsuitable. Topsoil, peat, coal and carbonaceous shale shall also be considered unsuitable material. All unsuitable material shall be disposed of and/or treated as discussed in Section 106.04 of the VDOT 2007 Road and Bridge Specifications at no additional cost to the Department. Topsoil or other organic soils are also considered unsuitable for use in embankment fill other than as a cover for slopes for the purpose of establishing vegetative cover. When used as cover for slopes, the thickness of topsoil shall not exceed twelve (12) inches.

The Design-Builder's qualified geotechnical engineer shall perform an inspection of all pavement subgrades and minor structure excavations immediately prior to placement of aggregate base, subbase or bedding materials to identify excessively soft/loose or saturated soils that exhibit excessive pumping, weaving or rutting under the weight of the construction equipment. Such soils are also considered unsuitable and must be removed or modified in place to provide adequate support for embankment, pavement subgrade or minor structures.

## 2.6.4 Chemically Aggressive Soil Conditions

The potential presence of chemically aggressive soils (CAS) and potentially chemically aggressive soils (PCAS) have been reported within the project limits per the Geotechnical Data Report for I-95 Express Lanes Southern Extension (January 26, 2016). When naturally occurring, these soils typically consist of unconsolidated sulfide-rich sediments in Coastal Plain formations and in some slate and phyllite formations along the I-95 corridor. Previous construction activities associated with the I-95 Express Lanes resulted in the disposal of CAS and PCAS within the project limits.

Exposure of sulfidic materials can severely inhibit roadside vegetation leading to increased erosion, acid run-off and decreased slope stability due to oxidation and degradation of the exposed materials. Prior to final seeding, the Design Builder shall perform Acid-Base Accounting Tests per EPA Publication 600/2-78-054 at a rate of 20 tests per acre. The samples will be collected from the top 6 inches of any area designated to receive seeding. Upon completion of the testing, the Design Builder shall submit a written report containing the test results and plan for the application of lime. Lime shall be applied at 1.25 times the net neutralizer deficiency noted in the test results. As an example, if the net neutralizer deficiency is found to be 12.77 tons (calcium carbonate equivalent in tons per acre/1000 tons of material), lime shall be applied at 15.96 tons per acre. In no case shall lime be applied at a rate less than 4 tons per acre, despite the results of the Acid-Base Accounting. In areas where the amount of lime needed is greater than 4 tons per acre, the contractor shall blend the lime into the upper six inches of soil by discing or similar blending method to fully incorporate the lime in to the soil.

Volumetric changes detrimental to pavements have also been reported within fills constructed from sulfidic materials.

Acid rock drainage is also a major environmental concern while the effects on structural elements (steel, concrete, etc.) can be seriously damaging within short time periods.

The Design-Builder shall investigate for the presence of chemically aggressive soils along the alignment (both naturally occurring and as a result of encapsulation) of the proposed construction, assess the potential impacts and implement appropriate avoidance and/or mitigation measures, if encountered. Soil borings and chemical laboratory testing shall be performed considering the guidance presented in Orndorff and Daniels (2002) during the geotechnical investigation to characterize and assess the potential impact of these soils.

Mitigation measures (singularly or in combination) that may be considered by the Design-Builder include, but are not limited to:

### Avoidance

- Adjust alignment to avoid CAS and PCAS.
- Covering unexcavated, undisturbed CAS and PCAS with non-aggressive fill soil.

### Minimization of Disturbance

- Adjust alignment and cut/fill areas to avoid CAS and PCAS that is cohesive and/or contains high PPA levels.
- Adjust alignment so earthwork operations avoid CAS and PCAS layers.
- Design drainage structures and piping not to penetrate CAS and PCAS layers.
- Avoid activities resulting in fluctuations (lowering) of the groundwater table as they may lead to the exposure of PCAS to oxygen.

#### Neutralization

- Commonly used mitigation technique where CAS is mixed with alkaline materials.
- Alkaline materials may include fine agricultural lime, dolomite, magnesite, hydrated lime, and sodium bicarbonate.
- Must be supported by the appropriate level of field and laboratory testing.

#### Strategic Reburial

- Suitable for CAS that has been neutralized and effectively covered with non-aggressive fill.
- Suitable for PCAS provided they are placed in a condition that will remain submerged by standing or surface waters.

### **2.6.5 Control of Rock Blasting**

#### **2.6.5.1 Blasting Control**

While not extensively anticipated, rock excavation may be required to construct this Project. If the Design-Builder elects to use explosives to remove rock, the Design-Builder shall include as part of the design team a blasting consultant, approved by the Department, with a minimum of 5-years experience developing blasting plans and providing oversight of blasting operations on highway projects in rock having comparable geologic lithology. A resume to include qualifications and relevant experience of the person responsible for review of blasting plans and oversight of blasting operations shall be submitted to the Department for approval before review and approval of the blasting plans. The consultant shall review the blasting plans used by the blasting contractor to verify it includes the results of blasting on a test section. The consultant shall make regular visits to the site as excavation progresses to verify that the plan need not be modified. The Design-Builder may utilize an in-house blasting expert to perform the role of the blasting consultant providing they meet the same minimum requirements as the blasting consultant noted above, have been approved by the Department and are not directly involved in the development of the blasting plans.

#### **2.6.5.2 Test Blast**

The Design-Builder's blasting consultant shall design a test blast that replicates the intended "weight per delay" and number of charges typical for a production blast. Seismic monitoring shall be provided for the test blast that includes monitoring points in proximity to the blast and at distances removed from the blast. Seismic records from the test blast shall be used to determine the regression of velocity and acceleration at various distances from the test blast.

These data shall be used to control the weight per delay as the blasting program progresses. Provide results from test blast program to VDOT prior to production blasting.

### **2.6.5.3 Vibration Control**

Control vibrations to less than 0.5 ips (inches per second) at the nearest structure. In addition to private/adjacent properties, this includes structures under construction and structures owned by VDOT. The contractor will be responsible for repairing any and all damage to adjacent facilities and structures for construction-induced damage.

### **2.6.5.4 Coordination and Review by Design-Builder's Geotechnical Engineer**

The Design-Builder's geotechnical engineer shall be on-site during grading operations or visit the site at sufficient intervals during construction to review slope excavation operations and verify the planned slope design is suitable or make modifications as approved by VDOT.

## **2.6.6 Pipe Installation Methods**

Culverts or utility pipes shall be installed by either conventional methods in accordance with Section 302.03 of VDOT's 2007 Road and Bridge Specifications, or Jack and Bore and/or by Micro-tunneling in accordance with the applicable Special Provisions contained in the RFP Information Package. Trenchless technology other than these methods of installation is not permitted unless otherwise approved by VDOT. The Design-Builder's Design Engineer shall choose which of the methods of installation is best suited for the ground and site conditions where the work is to be performed and that will meet the design requirements of the proposed culverts or utility pipes. The Design-Builder's Design Engineer shall be responsible to establish both the vertical and horizontal tolerances in support of the design. Such tolerances shall be noted on the Construction Plans. The design tolerance may be more stringent than what is called for in the both the Jack and Bore and Micro-Tunneling Special Provisions; however, under no circumstances shall the design tolerances used in design of either culverts or utility pipes exceed those specified in the VDOT 2007 Road and Bridge Specifications and the applicable Special Provisions. Performance requirements and tolerances stipulated in the Special Provisions shall also apply to conventional tunneling methods. If trenchless technology is used to complete roadway crossings, surface settlement monitoring must be performed to verify that there is no adverse impact on the stability and performance of the embankment and pavement structure above the pipe alignments in accordance with Section 302.03 of the VDOT 2007 Road and Bridge Specifications and the Special Provisions for Jack and Bore and/or Micro-Tunneling, as applicable.

## **2.7 Hydraulics**

The Design-Builder shall provide and/or perform all investigations, evaluations, analysis, coordination, documentation, and design required to meet all Hydrologic and Hydraulic, Drainage, Stormwater Management, Erosion and Sedimentation Control, Stormwater Pollution Prevention, and Virginia Storm Water Management Program permitting requirements of the standards and reference documents listed in Part 2, Section 2.1.

The ultimate proposed conveyance system (inclusive but not limited to culverts, stream realignment, and outfall conveyance channels through the project area) shall be designed by the Design-Builder to meet all applicable hydraulic requirements, including current Federal Emergency Management Administration (FEMA), Federal Highway Administration (FHWA), and VDOT guidelines as described in the VDOT Drainage Manual, (including current Errata Sheet), Hydraulic Design Advisories and applicable I&IMs.

This project is considered grandfathered under 9VAC25-870-48 in Part II of the VSMP Regulations and VDOT Method IIC applies for water quality control.

### **2.7.1 Drainage**

The drainage work shall include the design and construction of culverts and culvert connections, junction boxes, manholes, open channels, storm sewer systems with curb opening inlets, underdrains, and structures, downstream channel and flood protection measures, stormwater management facilities, and erosion and sediment control measures in compliance with the standards and reference documents listed in Part 2, Section 2.1 and the VDOT Erosion and Sediment Control and Stormwater Management Programs.

The Design-Builder shall prepare drainage design criteria and a list of software packages to be used in the design prior to commencement of work for review and approval by the Department.

All pipe culverts and storm sewer pipe for the Project shall conform to the allowable pipe types per standard PC-1. The Design-Builder shall provide VDOT two (2) paper and two (2) electronic copies on compact disc (CD) of a final drainage report incorporating all drainage calculations including pre and post development discharges, capacities, and supporting data such as drainage areas (with maps), ground cover calculations, etc. in accordance with the documentation requirements as outlined in the VDOT Drainage Manual. The Final Design Documentation for any hydraulic design shall be sealed and signed in accordance with latest IIM-243.

The Design-Builder shall assemble and review all available data, studies, and development plans impacting the Project corridor for use in preparing the drainage design. The Design-Builder shall perform a hydrologic analysis within the limits of the Project and extend the analysis to include all offsite areas that will drain through or impact the Project.

For the analysis required by the Minimum Standard-19 (MS-19) ESC Regulations, if the Design-Builder includes the effect of existing upstream SWM Basins for peak runoff attenuation, the Design-Builder shall obtain approval per Section 8.3.2.8 of the VDOT Drainage Manual. If the effect of upstream detention is considered in the projects MS-19 compliance, the Design-Builder shall be required to obtain existing site development plans and proof that the basins have adequate capacity for peak discharge attenuation. The Design-Builder shall ensure the existence of SWM maintenance agreements for each of these facilities. The drainage calculations shall include an analysis that demonstrates that even with the inclusion of upstream detention all MS-

19 requirements are met for each outfall and that all concerns listed in Section 8.3.2.8 of the VDOT Drainage Manual have been addressed. All site development plans, maintenance agreements, and other documents associated with the upstream basins shall be made a part of the final drainage report. The final SWM plan will also need to be shared with the local Municipal Separate Storm Sewer System (MS-4) permittee (Stafford County).

In the case that upstream detention is not considered, the Design-Builder will provide for on-site detention at outfall locations where the increase in flow increases flooding impact to downstream properties and shall include an analysis that demonstrates that with on-site detention all MS-19 requirements are met.

The Design-Builder shall design and install new drainage facilities and will be permitted to use existing drainage systems that have adequate structural and hydraulic capacities, in accordance with applicable standards and specifications set forth Part 2, Section 2.1.1.

All existing drainage facilities within the Project Right of Way that are impacted by the Design-Builder's activities and that the Design-Builder intends to leave in place shall be evaluated and verified to have adequate hydraulic capacity for ultimate land use conditions at the Design-Builder's cost. The Design-Builder shall evaluate and verify the structural adequacy of such existing drainage facilities which will be impacted by the project design and construction.

Where the existing drainage facilities do not meet either criteria above, the existing drainage facilities shall be plugged and abandoned in accordance with VDOT Road and Bridge Standard PP-1, removed, or replaced with adequate structures designed and constructed in support of the Design-Builder's final drainage design. Offerors should note that VDOT has not assessed the structural condition of the existing culverts and storm sewer pipes within the Project limits and does not warrant its structural adequacy. If after award the Design-Builder investigates the structural condition of the affected existing drainage facilities, and as a result proposes use (or repair) of some or all, then it shall be done only with VDOT's approval. The Design-Builder shall assess the structural condition of the structures by performing a visual/video inspection of the existing pipes and culverts utilizing the assessment criteria for Post Installation Inspections presented in VDOT Supplemental Specification 302. The Design-Builder shall provide VDOT with an inspection report documenting their assessment following the methodology as prescribed in the supplemental specification. The report shall include a certification from the Design-Builder's structural engineer attesting to the structural adequacy of the structures and specific recommendations relative to improvements to the structural condition and serviceability of the structures. The Design-Builder shall provide the report to VDOT for review and approval prior to proceeding to final design. With VDOT's approval, culverts deemed repairable shall be rehabilitated in accordance with VDOT's guidelines including, but not limited to those methods outlined in Chapter 8, Section 8.3.6.7 of the VDOT Drainage Manual and Special Provisions SU302001B Pipe Rehabilitation and SU302002A Pipe Replacement.

For the purposes of developing the Price Proposal, the Offeror shall assume that the existing drainage pipes and culverts within the Project limits which are a functional element of the proposed final drainage design, are in serviceable condition from a structural aspect (Note

that this assumption does not apply to the hydraulic adequacy of the pipes and culverts, and does not apply if the Design-Builder proposes to add fill above the current fill height over the existing pipes and culverts). If after award the Design-Builder determines that the serviceability of the existing pipes and culverts requires rehabilitation or replacement of some or all of the structures, then it shall be done only with VDOT's approval under a work order. Replacement of pipes and culverts required as a result of hydraulic inadequacy or as a result of additional fill placed above the current fill height over the existing pipes and culverts shall be included in the Offeror's Price Proposal, and will not be accomplished under a work order.

No drainage inlet grate or at-grade structure will be permitted to be located or extend within the travel way of the Interstate or the associated Interstate ramps, unless otherwise approved by the Department.

All existing culverts, storm sewer, and drainage appurtenances to be abandoned shall be removed or plugged and abandoned in accordance with VDOT Road and Bridge Standard PP-1.

During the Work period, the Design-Builder shall provide for positive drainage of all roadway facilities open to construction traffic. Construction activities shall not redirect or add drainage run-off to any private property.

Underdrain outfall locations are not shown in the RFP Conceptual Plans and it shall be the responsibility of the Design-Builder to develop the underdrain design including adequate outfall locations. The Design-Builder may, at its discretion, utilize access structures (i.e. manholes, cleanouts, etc.) in lieu of EW-12's in order to outfall an underdrain according to the guidelines set forth in the 2008 VDOT Road and Bridge Standards and the VDOT Drainage Manual while maintaining the ability for the underdrain to be accessed in the future for maintenance purposes.

### **2.7.2 Stormwater Pollution Prevention Plan (SWPPP)**

A SWPPP, including, but not limited to, an Erosion and Sediment Control (ESC) Plan and Narrative, a Pollution Prevention (P2) Plan, and a post construction Stormwater Management (SWM) Plan shall be prepared and implemented by the Design-Builder in compliance with applicable requirements of the standards and reference documents listed in Part 2, Section 2.1 including the Virginia Erosion and Sediment Control Law and Regulations and the Virginia Stormwater Management Program (VSMP) Law and Regulations. In order to meet key construction dates, VDOT will provide for the Design-Builder an approved Phase 1 Erosion and Sediment Control plans for the clearing and grubbing phase.

It shall be the responsibility of the Design-Builder to have a qualified person within their team structure, other than the ESC and post construction SWM Plan designer, who is authorized and/or certified by the Virginia Department of Environmental Quality (VDEQ) to perform plan reviews, independently review and certify that the ESC Plans and Narrative and post construction SWM Plan for the Project are in accordance with VDOT's Approved ESC and SWM Standards and Specifications. Before implementing any ESC or post construction SWM measures not included in VDOT's approved ESC and SWM Standards and Specifications, a

variance or exception respectively must be requested through the District Drainage Engineer in accordance with the latest versions of IIM-LD-11, IIM-LD-195, and IIM-LD-251.

The Department will obtain prior to NTP a VPDES General Construction Permit for the Discharges from Construction Activities (VPDES Construction Permit) based on the RFP Conceptual Erosion and Sediment Control Plan and preliminary SWPPP. The Design-Builder shall review the VPDES Permit and has the option to use the approved activities under the VPDES Permit. Should the Design-Builder select to revise the approved activities, the Design-Builder shall complete and submit a revised ESC and SWM Plan per the requirements indicated in the paragraph below. The Design-Builder shall provide VDOT two (2) paper and two (2) electronic copies each on CD of the final ESC Plan and Narrative, P2 Plan and post construction SWM Plan incorporating all calculations, analysis, documentation and evaluations required. The ESC Narrative shall specifically include calculations (with supporting data) documenting that the design meets the water quantity requirements for downstream channel flood protection in the ESC Law and the VSMP Regulations, as appropriate, for each location where stormwater is discharged from the Project site.

If the Design-Builder selects to revise the approved Erosion and Sediment Control Plans, the Disturbed Area, or the information provided on the approved LD-445 forms, the Design-Builder is responsible for providing to the Department the necessary information and funds for revising the permit coverage for the Project. The Design-Builder shall be responsible for all fees necessary for coverage under the VPDES General Construction Permit. The Design-Builder shall review the applicable sections of the VPDES Construction Permit Registration form (LD-445), VPDES Construction Permit Contact Information (LD-445A), VPDES Construction Permit Fee Registration form (LD-445B). These forms along with the completed ESC and SWM Plan Certification form (LD-445C) and a check in the amount of the permit fee made payable to the Treasurer of Virginia shall be submitted to the VDOT Project Manager. The VDOT Project Manager will review the submitted information and, if complete and acceptable, process a request for coverage under the VPDES Construction Permit in accordance with VDOT's guidelines as outlined in the latest version of IIM-LD-242. If any information submitted by the Design-Builder is found to be incomplete and/or unacceptable, the assembly will be returned to the Design-Builder for corrective action and resubmission.

A revised working conceptual ESC and post construction SWM Plan and SWPPP for the entire Project must be submitted for review and approval with the initial application for permit coverage. This revised conceptual Plan submittal shall include the proposed total expected Land Disturbance Area and Land Development Area, including any off-site facilities, for the entire Project. Where the Project will be constructed in segments, the Design-Builder shall submit a finalized ESC Plan, a post construction SWM Plan and a P2 Plan, including the expected Land Disturbance Area, for the proposed initial work segment in addition to the conceptual plan for the entire Project. It is expected that the individual work segment submittals will be self-sustaining and not incur a deficit in post construction SWM design requirements requiring mitigation on future work segments. Subsequent work segment submittals shall include required modifications to the Land Disturbance Area value. However, these modifications, in total, shall not exceed the initially submitted Land Development Area value. The Design-Builder shall

accept all risk to the schedule and cost for revising the RFP Conceptual Erosion and Sediment Control Plan or the Disturbed Area.

The Design-Builder shall be responsible for compliance with construction-related permit conditions and shall assume all obligations and costs incurred by complying with the terms and conditions of the permit. Any fines associated with permit or regulatory violations shall be the responsibility of the Design-Builder. Upon completion of the entire regulated land disturbing activity (including final stabilization of all disturbed areas), the Design-Builder shall provide updated/revised Permanent Best Management Practice (BMP) information in Section VI of the SWPPP General Information Sheets for each post construction BMP placed into service on the Project, complete the VPDES Construction Permit Termination Notice form (LD-445D) and submit both documents (without signature) to the VDOT Project Manager for processing. The Design-Builder shall also have on-site during any land disturbing operations an individual or individuals holding a VDEQ Inspector Certification, a VDEQ Responsible Land Disturber (RLD) Certification and a VDOT Erosion and Sediment Control Contractor Certification (ESCCC) to ensure compliance with all VDEQ and VDOT erosion and sediment control plan implementation requirements.

### **2.7.3 Post-Construction Stormwater Management Facilities**

The Design-Builder shall be responsible for the design and construction of stormwater management facilities as required for the Project in accordance with IIM-LD-195.8, and the other standards and reference documents listed in Part 2, Section 2.1 including the Virginia Stormwater Management Program Law and Regulations, and shall comply with the minimum geotechnical requirements contained therein. Performance Based Methods shall be used for determining post construction phosphorous removal and treatment requirements. For BMPs in series the pollutant bypass in terms of pounds of phosphorous per year shall be used as the pollutant inflow plus the pollutant loading from any sub-basin draining directly to the BMP.

VDOT has identified potential locations for post construction stormwater management facilities as part of the RFP Conceptual Plans. However, these locations are preliminary and have not been fully evaluated to determine if these locations are suitable, feasible or sufficient to address all of the stormwater management requirements of the project. The Design-Builder, as part of their final design, shall evaluate these locations, and if found acceptable, develop a final post construction stormwater management plan.

No stormwater management facilities, including basins or manufactured BMP units, are allowed within the median area north of Garrisonville Road unless as shown in the RFP Conceptual Plans. No stormwater management facilities are allowed within the median area south of Garrisonville Road that precludes an additional fourth lane both Northbound and Southbound to be constructed in the median of the I-95 GP Lanes.

If any of the locations are found to be unacceptable, the Design-Builder must identify other acceptable location(s) to meet the post construction stormwater management requirements of the Project. The Design-Builder is to insure proper ingress and egress to any stormwater

management facility and that any specific proprietary facilities have proper maintenance details included in the Record (As-Built) Plans.

VDOT has purchased 6.2 lbs of nutrient credits per year to meet an estimated 25% of the Project phosphorus removal requirements as described in IIM-LD-251. The Design-Builder, as part of their final design, shall develop a final post construction SWM plan for the Project. Any changes in the scope or footprint of the established basic project concept, proposed by the Offeror and acceptable to VDOT, may require additional analysis to be performed by the Design-Builder at their cost.

If the Design-Builder determines that additional phosphorus reduction is required relative to their unique design, the Design-Builder will provide for and include the required compensatory mitigation in the post construction SWM Plan. The Offeror shall account for all cost associated with the post construction Stormwater Management Plan, as well as compensatory mitigation, in its Price Proposal.

#### **2.7.4 Other Drainage Requirements**

All existing drainage facilities located within the Project limits that are disturbed or extended as a part of the project and are functional elements of the final design shall be rendered in a serviceable condition, free from debris and physical obstructions. Accumulated debris resulting from project construction activities shall be removed by the Design-Builder, as such maintaining the original line and grade, hydraulic capacity or construction of the facility prior to the final acceptance of the Project.

For connections where a new pipe is required between the culverts underneath the Southbound and North Bound lanes and where the height of fill is over 20 feet, a minimum diameter of 60-inches shall be used per the VDOT Drainage Manual Section 8.3.6.6.

An assessment of the serviceable condition (cleanness) of the existing drainage structures located within the Project limits shall be conducted prior to the commencement of any land disturbing activities by the Design-Builder and provided to the VDOT Project Manager. The Design-Builder shall not be responsible for cleaning out existing debris accumulations in drainage facilities. Pre-existing debris will be addressed by VDOT.

#### **2.7.5 Relocated Stream Channel**

The Design-Builder shall relocate the stream channel at the toe of fill of the 95 Express Lanes Southern Terminus Extension along the southbound lanes from approximately Station 2195+50 to 2200+00. The relocated stream shall be in accordance with the Virginia Drainage Manual Section 7.2.3, Section 7.3.5, Section 7.5.4, and guidelines in the current version of the FHWA HEC-20.

The relocated stream shall match the minimum sinuosity of the downstream natural channel section and shall include a riparian buffer, a 5 feet maintenance bench at the toe of the proposed fill, and at least one riffle and pool section. The design of the relocated channel and in-stream

features shall meet minimum criteria in the current Virginia Stream Restoration and Stabilization Best Management Practice Guide. The Design-Builder shall prepare a detailed plan and profile with cross sections of the relocated channel, including details for in-stream measures, a riparian planting plan, and a phased erosion and sediment control plan for approval by VDOT. The plan view of the relocated channel shall include proposed contours.

## **2.8 Landscaping**

Section not applicable to this project.

## **2.9 Traffic Control Devices**

The Project shall include all Traffic Control Devices (TCD), including temporary and permanent installation of the following: signage, guardrail/barrier, pavement markings/markers, lighting, and intelligent transportation systems. All TCD designed and installed under the Project shall be in accordance with standards and references in Part 2, Section 2.1. The Signing and Pavement Marking Plans, Intelligent Transportation System (ITS) Plans, Lighting Plans, and Transportation Management Plan (TMP), including Temporary Traffic Control and Traffic Operations Plans are required from the Design-Builder for final approval by VDOT and shall be included as planned work package(s). The Design-Builder shall comply with the Special Provision for Personnel Requirements for Work Zone Traffic Control and the Special Provision for Work Zone Traffic Control Management, Design-Build Projects.

All existing TCD impacted by the Project shall be modified, upgraded, or replaced by the Design-Builder to meet current VDOT standards.

All Traffic Structures except gates shall be located as to not preclude a future fourth lane widening towards the median of the I-95 GP Lanes (both Northbound and Southbound), and to not preclude a future second Express Lane and shoulder on the west side of the 95 Express Lanes. Overhead signs shall be designed and constructed such that required horizontal and vertical clearances will be maintained from the future travel lanes. ITS poles, cabinets, and other devices shall be designed and constructed to be outside the future construction footprint.

### **2.9.1 Signs**

The Design-Builder shall be responsible for modifications to existing signs and sign structures, and furnishing and installing all required new temporary and permanent signs and structures. The final lines of sight and sight distances must be considered in the placement of all Project signage.

An existing sign inventory shall be completed prior to site demolition in accordance with the VDOT Traffic Engineering Design Manual. This existing information shall be submitted at the same time as the first plan submittal for proposed signing.

All signs and sign structures to be removed during the construction of the Project shall be disposed of by the Design-Builder. Temporary relocation of signs may be necessary as part of

this Project and it is the responsibility of the Design-Builder to perform all the required sign relocations.

All new, replaced, and relocated overhead signs shall be evaluated for illumination in accordance with IIM-TE-380. All instances of “should be provided” in IIM-TE-380 shall be considered as “shall be provided” unless otherwise approved by VDOT. The sign lighting shall be designed and constructed in accordance with VDOT Traffic Engineering Design Manual, Section V – Roadway Lighting, Chapter 4, Section 4.5.1, VDOT 2008 Road and Bridge Standards, VDOT Road and Bridge Specifications, Section 705, and the MUTCD. All conductor/communication cables shall be in conduit and junction boxes; no direct burial cable allowed. Power cables and communication cables shall be in separate conduit systems.

### **2.9.1.1 Limits of Project Signing**

The Design-Builder shall replace all existing ground mounted and overhead mounted signage that are affected by the Project and install new signing within the Project limits, including signs outside the Project limits that are necessary to lead traffic to the Project. Any signing on adjacent roadways beyond the Project limits that require relocation, replacement, or modification due to the proposed design shall be the responsibility of the Design-Builder.

Only existing signs which meet current MUTCD and VDOT standards may be reused as a part of this Project.

### **2.9.1.2 Signing Plan Requirements**

The signing plans shall be prepared at a one (1) inch = fifty (50) feet scale when plotted full size at thirty-five (35) inches by twenty-three (23) inches. The signing plans shall show the proposed sign message, MUTCD or Virginia Supplement sign designation (if applicable), size and location of all signs. The structure type used for mounting sign shall be noted on the signing plans. These signing plans shall show the location and messages of all existing signs. All existing sign removals shall be shown on the signing plans.

Additionally, the Design-Builder shall prepare and submit for approval a Sign Sequencing Plan and a Sign Unveiling Plan. The Sign Sequencing Plan shall be coordinated with and included in the Traffic Management Plan defined in Part 2, Section 2.10. The Sign Unveiling Plan shall be coordinated with the events of the Traffic Management Plan and the opening schedule of the completed lanes. Both plans shall be approved by VDOT and Transurban prior to implementation. These plans shall provide a detailed sequence for covering and removing the existing signs and unveiling the covered existing and completed proposed signs. The Sign Sequencing Plan shall be focused on signs during construction activities while the Sign Unveiling Plan shall be focused on opening the completed lanes to traffic. VDOT and Transurban will coordinate with the Design-Builder to provide a permitted timeframe to implement these plans.

### 2.9.1.3 Design of Sign Panels and Locations

VDOT has provided a preliminary sign design and layout plan in the RFP Conceptual Signing and Pavement Marking Plan. The Offeror shall include all overhead and Express Lane Entrance signs as shown on the RFP Conceptual Plan in the Price Proposal.

Proposed and replaced sign panels shall be in accordance with the VDOT 2007 Road and Bridge Specifications and other references in Part 2, Section 2.1. Overhead sign structures shall be located, designed, fabricated, and constructed in accordance with applicable standards and specifications. The Design-Builder shall coordinate all sign locations with all proposed and existing signing, landscaping, fencing, signals, utility, drainage, and all other roadside features to assure proper clearances and adequate sight distances. Sign sizes shall adhere to the latest edition of the FHWA Standard Highways Signs Book, the current edition of the MUTCD, the 2011 Virginia Supplement to the 2009 MUTCD, and all applicable Traffic Engineering Division Numbered memoranda. All Advance Guide Signs shall be mounted on overhead sign structures; Supplemental Guide Signs may be ground mounted. No signs shall be mounted on bridges.

The Design-Builder shall use Standard VDOT sign structures for new and relocated signs. Ground-mounted sign structures on I-95 shall use Standard SSP-VIA or SSP-VA structures, unless otherwise approved by VDOT. For all non-standard signs, the Design-Builder shall use GUIDSIGN software to design the sign panels. The Design-Builder shall utilize the current edition of the MUTCD, 2011 Virginia Supplement to the 2009 MUTCD, the FHWA's Standard Highway Signs including Pavement Markings and Standard Alphabets to design all non-standard signs that do not have a MUTCD or VDOT standard sign designation. Clearview font will not be allowed as an alternative lettering style for this project.

Prior to obtaining VDOT approval of final signing plans, the Design-Builder shall coordinate the permanent location of sign structures and all proposed, relocated, or modified with Integrated Directional Signing Program (IDSP) signs such as Supplemental Guide Signs (SGS), Specific Travel Services (Logo) Signs, General Motorist Services Signs (GMSS), Tourist Oriented Directional Signs (TODS), and all other signs approved and maintained as part of the IDSP. All impacts to IDSP signs shall be reviewed and approved by the IDSP Manager before relocation, fabrication, and installation. Whenever possible all proposed, relocated, or modified IDSP signs shall not be installed in sign assemblies with other non-IDSP signs. IDSP signs shall be installed on 2 ½ inch square tube posts and concrete foundations in accordance with Standards STP-1, Standards SSP-VA structures and foundations, or Standards SSP-VIA structures and foundation as appropriate and as approved by the IDSP Manager. The Design-Builder is responsible for costs associated with removal and replacement of IDSP signs.

Longitudinal BMP features such as bio-retention swales shall be clearly delineated by signs/markers for maintenance purposes at the beginning and end of the feature.

The Express Lanes signage scheme shall:

- Support the integration of the Express Lanes with the existing road network

- Facilitate navigation of the road network, including access to, travel along and egress from the Express Lanes,
- Be consistent with the existing directional and regulatory signing system on the existing road network and the I-95 Express Lanes.

The types of signage that constitutes directional and Express Lanes signage include:

- Advance direction signs
- Advance exit signs
- Exit direction signs
- Reassurance signs (static and dynamic)
- Permission signs

New full span sign structures and foundations shall be designed to accommodate an additional static sign load of 200 sq. ft. for future use.

The Design-Builder shall design, furnish, and install one span structure to accommodate an additional static Type 1 DMS sign with walkway as shown in the RFP Conceptual Plans. The actual DMS sign and associated wiring will be installed by others and is not part of the project. The Design-Builder shall provide the location of this future sign in the structure drawings for review and acceptance by VDOT. The Department will provide a representative shop drawing for design purposes. Additional static sign loading of 200 sq. ft. for future use shall not be applicable to this sign structure.

The Design-Builder shall be responsible for planning, coordinating, and obtaining Regulatory Approvals, if required, and removing and disposing of structures and obstructions. The Design-Builder shall relocate or adjust all signs within the construction limits that conflict with construction work. Signs that are not needed for the safe and orderly control of traffic during construction may be removed and stored in a manner that will preclude damage and shall be reinstalled in their permanent locations prior to Final Acceptance.

The Design-Builder shall be responsible for coordination with VDOT or the pertinent local agencies or jurisdictions in order to install directional signage, including, without limitation, obtaining all applicable Regulatory Approval.

The Design-Builder shall provide the necessary guide, warning and regulatory signs for the Project.

The Design-Builder shall maintain all existing signs during construction, unless they are to be removed permanently or have been replaced as required by the Project. For any existing signs that require relocation due to construction, the Design-Builder shall present pertinent details – such as sign designs, mounting details, locations etc. – for VDOT’s review and comment, prior to relocation.

The Design-Builder shall modify or remove existing signs and structures that are rendered inaccurate, ineffective, confusing or unnecessary. The Design-Builder shall obtain VDOT's approval prior to making any such changes.

The Design-Builder shall identify all existing signage impacted by the Project, including signs and associated sign structures that are outside the physical limits of roadway construction. For modifications (including adding, deleting or modifying sign panels) to any existing overhead/cantilever sign structure affected by the Project, the Design-Builder shall provide comprehensive structural analysis for VDOT's review and written comment prior to the commencement of design in accordance with Part 2, Section 2.3.12. If it is determined that modifications to the existing sign structure and/or signs are not structurally acceptable, the Design-Builder shall provide new signs and structures, in accordance with standards and references in Part 2, Section 2.1.1, to replace the existing sign structures and signs.

The Design-Builder shall place milepost and intermediate markers at 0.2 mile intervals facing northbound on the right side of the roadway on the reversible lanes and facing southbound on the left side of the roadway. The mile markers shall conform to MUTCD Figure 2H-2, Reference Location Signs, and intermediate markers shall conform to MUTCD Figure 2H-3, Intermediate Reference Location Signs.

For signing along the mainline, all guide signs, dynamic message signs and supplemental guide signs on overhead structures shall be installed such that 800 foot minimum spacing is maintained between signs. In areas where the 800 foot minimum spacing cannot be maintained the Design-Builder shall obtain a design waiver/exception from VDOT to reduce the spacing.

The Design-Builder shall perform line of sight analysis for all sign structures as necessary to confirm drivers have sufficient time to read the sign messages, and signs are not visually obstructed.

The Design-Builder shall provide accurate and detailed elevations for all sign structures, including all dimensions, existing physical features and proposed constructed features to confirm physical locations and orientation.

## **2.9.2 Signals**

Section not applicable to this project.

## **2.9.3 Guardrail/Barrier**

The Design-Builder shall ensure that the clear zone within the Project limits is free from hazards and fixed objects. In the event that removal or relocation of hazard and fixed objects from the clear zone is not feasible, the Design-Builder shall design and install an approved guardrail barrier system and end treatments, where appropriate, for protection in accordance with NCHRP 350 or AASHTO Manual for Assessing Safety Hardware, First Edition. The same clear zone requirement applies to existing conditions affected by this Project where guardrail upgrade will be required. Existing sub-standard guardrail within the Project Limits shall be upgraded by

the Design-Builder to meet current standards per the VDOT Road Design Manual, Appendix I. This may require the upgrade of guardrail to the nearest logical termination point beyond the current Project limits.

The Design-Builder shall be responsible for installing, replacing, or upgrading any existing guardrail/barrier on the 95 Express Lanes within the Project limits currently designed for one-way traffic operations to allow for two-way traffic operations.

All Transurban traffic structures (cabinets, sensors, poles, etc.) shall be shielded from traffic by an approved barrier system at all times. Prior to removing the existing Concrete Traffic Barrier Service at the Garrisonville Road exit, the Design-Builder shall show the sequence of shielding the existing infrastructure in the Traffic Management Plans defined in Part 2, Section 2.10. After removal from its current location, the existing Concrete Traffic Barrier Service shall be delivered to:

Virginia Department of Transportation  
Express Lanes Maintenance Yard  
Immediately off of U.S. Route 1, just north of the Occoquan River Bridge  
Lorton, VA 22079

Fourteen (14) days prior to installation of guardrail the Design-Builder shall request VDOT field verification of the proposed layout. Accompanied by the Design-Builder, VDOT representative will inspect the locations and advise on any necessary adjustments. Additionally, the Design-Builder shall provide a copy of the manufacturer's recommendations for installation of all guardrail terminals to the VDOT Project Manager before the installation of any guardrail end treatment of terminating device.

#### **2.9.4 Pavement Markings/Markers**

The Design-Builder shall include all required pavement markings, markers, and delineators. Pavement markings, markers, and delineators shall conform to the requirements of the MUTCD, the 2011 Virginia Supplement to the 2009 MUTCD, and applicable special provisions (included in the RFP Information Package). All pavement marking plans shall be in accordance with VDOT Traffic Engineering Design Manual, dated 2011.

Pavement markings shall be Type B, Class VI, patterned preformed tape. Raised Snow-Plowable Pavement Markers shall be installed along I-95 GP Lanes, 95 Express Lanes, and at ramp gore areas in accordance with the standards and references in Part 2, Section 2.1. All permanent markers shall be raised snow-plowable markers.

All existing pavement markings and markers that do not conform to the final traffic patterns shall be eradicated and removed in accordance with Part 2, Section 2.6.1 and the standards and specifications listed in Part 2, Section 2. 1.

The Design-Builder shall install a minimum of two (2) EZ-Pass logo pavement markings for the proposed northbound entrance ramp. The final location shall be shown in the signing and

striping plan for approval by VDOT. Details of the EZ-Pass logo are included in the RFP Information Package.

The Design-Builder shall install channelizing posts at the proposed emergency crossover to discourage unauthorized use. The channelizing posts shall be installed at 5 feet on center and shall be located outside the clear zone of all roadways or between the guardrail terminals where guardrail is provided as clear zone shielding.

## **2.9.5 Intelligent Transportation Systems**

The Design-Builder shall be responsible for the design and installation of an Intelligent Transportation System (ITS). Intelligent Transportation Systems may also be referred to as Electronic Toll and Traffic Management (ETTM) Systems in other project documents.

### **2.9.5.1 Definitions and Abbreviations:**

Definitions and abbreviations as indicated below are in addition to those noted in Part 4.

**Burn Period** - The time duration required for the ITS devices to successfully operate over consecutive days in a real-world condition, without interruption due to device or system deficiencies or failures.

**Commissioning** - means the systematic verification of each component or system of the Design-Build Project in question is physically complete, checked, calibrated and safe for initial operation.

**Level A Testing** – The objective of this test is to certify roadside equipment installed by the Design-Builder is installed and fully operational in line with agreed design requirements and via executing test plans and procedures approved and witnessed by Transurban. The Design-Builder shall be responsible for this test and shall be accountable for successful and on-time execution of this test.

**Level B Testing** – The objective of this test is to certify roadside equipment is successfully integrated with Transurban’s Tolling and Traffic Management System (TTMS) network via executing test plans and procedures approved and witnessed by Transurban. The Design-Builder shall be responsible for this test and shall be accountable for successful and on-time execution of this test.

**Level C Testing** – The objective of this test is to certify Transurban’s TTMS platform can communicate and control roadside equipment via executing test plans and procedures defined by Transurban. Transurban will be responsible for this test and the Design-Builder shall support Transurban for successful and on-time execution of this test.

**Roadside Equipment (RSE)** – The Roadside Equipment is to include Dynamic Message Signs (DMS) to provide toll and driver information and general traffic management information; Pan-tilt-zoom (PTZ) CCTV and Automated Incident Detection (AID) cameras to provide video

surveillance; traffic monitoring sensors to provide traffic volume, lane occupancy, and speed data; roadway gates (and all related systems) at all reversible access points, and all supporting electrical and communications equipment to support the Traffic Management System (TMS), including but not limited to service panels, generators and cabinets.

Service Commencement - means the opening of the Project, or one direction of traffic, for normal and continuous operations and the safe use by the travelling public.

Traffic Management System – means any application of computer, electronics and/or telecommunications equipment and software and supporting fixtures and equipment whose function is to provide information, data and/or services to the traveling public, the Department or Transurban to manage and control traffic.

EXPRESS-OC – Express Lanes Operation Center

NRO – VDOT Northern Region Operations

ATMS – Advanced Traffic Management System

MPSTOC – McConnell Public Safety and Transportation Operations Center

### **2.9.5.2 Existing ITS Roadside Equipment and Infrastructure**

Existing ITS roadside equipment and infrastructure is located within the project limits. Portion of the ITS roadside equipment and infrastructure is owned and maintained by VDOT while other portions are owned and maintained by Transurban.

Existing ITS roadside equipment installed under permit with VDOT and Transurban may include, but is not limited to, the following equipment located within the Project Right of Way:

- Weather stations;
- DMS for the existing Express Lanes and GP Lanes to provide general traffic management and Express Lanes regulatory information;
- Express Lanes access gates;
- Ramp meters;
- CCTV cameras;
- Traffic monitoring sensors; and
- Fiber optic cables.

The Design-Builder shall relocate existing VDOT and Transurban ITS roadside equipment located within the Project Right of Way that is affected by construction, including power and communication service to the equipment, and shall ensure that loss of functionality is minimized.

VDOT and Transurban will remain responsible for the operations and maintenance of the existing and relocated VDOT and Transurban ITS roadside equipment, respectively.

### **2.9.5.3 System Design Documentation**

The following system design documentation shall be prepared and submitted to VDOT by the Design-Builder:

Technical Specifications - shall be a document or documents that specify the technical design of the roadside equipment that will comprise the ITS System and its interfaces, including reversible operations and gate control.

Test strategy – shall establish the principles of, and the Design-Builder’s approach to, the testing of the ITS system and the interfaces, including the test stages and processes.

### **2.9.5.4 CCTV Video Coverage**

Dedicated CCTV cameras shall be provided for the following functions:

- Surveillance of the Express and GP Lanes including, approaches and interchanges
- AID on the Express Lanes

CCTV video coverage must be provided by PTZ CCTV cameras mounted on poles to enable EXPRESS-OC operators and VDOT operators to observe traffic within the limits of the Express Lanes at all hours of the day and in all weather conditions normally encountered in Virginia, consistent with reported visibility restriction (i.e., during snow storms, fog, etc.). The video provided must be stable, jitter-free, and suitable for video-based AID.

The Design-Builder shall replace existing cameras that are disturbed by the Project.

Dedicated cameras shall be provided for surveillance of the Express Lanes or to enable video-based AID under EXPRESS-OC operator control.

CCTV line-of-sight distances shall provide for full CCTV coverage of the 95 Express Lanes and I-95 GP Lanes without image degradation. The CCTV cameras shall be placed at a minimum mounting height of fifty (50) feet.

All cameras installed by the Design-Builder shall meet the requirements of Special Provision for Section 803 – Camera System, as included in Part 2, Section 2.1.

The video surveillance system must enable the identification of the number and vehicle types involved in an incident at all locations within the surveillance area.

The video provided must be stable at all zoom settings when viewing objects up to one mile away.

### **2.9.5.5 Video-based AID**

The Design-Builder shall implement video-based AID for the Express Lanes at locations where:

- Roadway gates are installed,
- Traffic enters or exits Express Lanes,
- The risk of traffic incidents is expected to be higher than average, and
- Rapid detection of incidents is required for special reasons, such as near critical infrastructure.

The video-based AID system should be compatible to the existing EXPRESS-OC Traffic Management System and capable of:

- Detecting 95% of incidents involving stopped vehicles, slow vehicles, and slow traffic that are within the field of view of an AID camera or other equipment as specified;
- Detecting pedestrians on the roadway within the field of view of an AID camera or other equipment, as specified;
- A false alarm rate of less than one false alarm per 10 true alarms; and
- Detecting incidents and providing an alarm to the EXPRESS-OC and the NRO MPSTOC in less than 30 seconds

Upon the detection of an incident, the AID system must be capable of recording the video at a rate of at least five frames per second for a period of 60 seconds.

### **2.9.5.6 Video Recording**

It shall be possible to simultaneously record video from CCTV cameras, as designed, at a rate of at least one frame per second.

Sufficient capacity must be provided to store the recorded video from CCTV cameras for a duration determined by VDOT and continue to record video without intervention.

### **2.9.5.7 CCTV Communications Standards**

The CCTV communications shall support the appropriate National Transportation Communications for ITS Protocol (NTCIP) 1205 communication protocol (version 1.08 or higher) to provide for functionality with the NRO MPSTOC ATMS software in accordance with the Interface Control Document (ICD).

### **2.9.5.8 Traffic Monitoring Sensors (Microwave Vehicle Detectors)**

Traffic monitoring sensors are to be installed to monitor and report in real-time traffic volume, lane occupancy and speed data on the Express Lanes and, where applicable, the GP Lanes. Such sensors shall enable VDOT to monitor the performance of the Project corridor.

Information collected on the GP Lanes and Express Lanes shall be made available for integration into the existing 95 Express Lanes systems. Data will be provided in raw form and be subject to quality control requirements prior to submittal to VDOT. Data shall be aggregated in increments to be mutually agreed.

Traffic monitoring sensors shall be installed by the Design-Builder approximately every 1/3 mile on the Express Lanes. Traffic monitoring sensors shall also be installed at the same spacing to cover both the Northbound and Southbound GP Lanes. Under unusual circumstances or in specific situations, longer spacing may be used as long as data collection and operational requirements are met. Additionally, traffic monitoring sensors shall cover GP lane's entry and exit points to and from the Express Lanes.

Traffic monitoring sensors shall be installed on ITS poles based on the manufacturer's recommended mounting heights. Each detection zone shall be shown on plans as a part of the final Design Documentation. Traffic monitoring sensors shall be located to gather data from both the 95 Express Lanes and GP Lanes wherever possible.

### **2.9.5.9 DMS**

The toll and driver information (T&DI) DMS for the Express Lanes shall be located at strategic locations for the Express Lanes and will display information to allow drivers to make decisions on whether to use the Express Lanes. The locations are shown on the RFP Conceptual Plans.

DMS cabinet shall be placed in front of DMS at a distance such that the technician can read the message displayed on the DMS while working at the DMS cabinet. Each T&DI or traffic management DMS shall be viewable by at least one PTZ CCTV camera such that the message displayed on the DMS can be visually confirmed by an operator in the EXPRESS-OC and the NRO MPSTOC.

### **2.9.5.10 Communications Infrastructure**

The existing communications infrastructure must remain in place or be replaced in kind, as specified in the standards and specifications set forth in Part 2, Section 2.1.

Communication between the ITS Equipment and the ETTM Facilities shall be via a fully redundant fiber optic network using Spanning Tree Protocol (or equivalent) to ensure no single points of failure and reliability and shall comprise:

- Local Express Lanes trunk fiber optic loop
- Local Express Lanes distribution fiber optic loop(s)
- Redundant switch equipment

The local Express Lanes trunk and distribution fiber optic loops shall be comprised of new fiber optic cable.

All new fiber optic cables shall be protected to prevent rodent damage, including but not limited to installing screens at bases of all ITS poles, installing toggle bolts/washers for manhole covers, and installing manhole covers without manhole hook holes to eliminate rodent entry.

The new communications conduit bank for the Project shall consist of 2 four-inch diameter PVC conduits with the following configuration:

- One trunk four inch conduit and one distribution four inch conduit containing a 3-barrel textile inner duct carrying:
  - A 36-fiber Express Lanes distribution cable (installed in one (1) four inch conduit)
  - A 36-fiber Express Lanes trunk cable (installed in one (1) four inch conduit)

Communications and conductor cables shall be placed in separate buried conduits, embedded conduits, or structure and bridge- mounted conduits. Communications and conductor cables shall not share conduits, junction boxes, or related appurtenances.

The Design-Builder shall install a conditioned communications hub cabinet at each end of the project limits to house Layer 3 switches. The hub cabinets shall serve as the termination and connection points for the trunk fiber creating a ring topology around the distribution layer. In addition, the Design-Builder shall provide Uninterruptible Power Supply (UPS) back-up power for the operations of the designated communications hub cabinets.

The Design-Builder shall coordinate with Transurban to determine which fibers will need to be spliced to the existing 95 Express Lanes fiber to provide connectivity to the Express Lanes Operations Center. The Design-Builder shall be responsible for providing the necessary switch capacity and optics to support connectivity to the existing infrastructure.

The Design-Builder shall provide fiber splicing diagram plans showing details of every splice and termination for every fiber strand as a part of the final Design Documentation. The number, color, and fiber assignment of each buffer tube and fiber strand shall be included. No underground splices shall be allowed.

The maximum allowed cable length of a Category 5 or 6 Ethernet cable is 328 feet. If a longer running distance is needed, a media converter shall be used to convert Ethernet data to fiber optic signals.

The Design-Builder shall furnish and install new ITS equipment cabinets for exclusive use to support the Express Lanes devices. Existing VDOT equipment cabinets shall not be used.

The Design-Builder shall furnish and install new conduit for exclusive use to support the Express Lanes ITS equipment. Existing VDOT conduits shall not be used.

The Design-Builder is responsible for designing the connection diagrams, including the communications equipment to be provided in each cabinet and how the equipment connects to the fiber optic cables. The design shall be consistent with the 95 Express Lanes Network Architecture as described in the diagram in Special Provision 805.

### **2.9.5.11 Power**

The Design-Builder shall design, install, connect, and maintain electrical power service to sustain all operations for the ITS System, including all other facilities required for the Project.

The Design-Builder shall be responsible for new utility service connections, including full coordination with the utility owners and payment of connection fees. The Design-Builder shall be responsible for paying the monthly utility bills associated with new service panels, up to and including the date of final project completion.

The Design-Builder shall be responsible to perform or cause to be performed the design, supply, and installation of all new power feeds (from service panel to power source) necessary or feed modifications requiring service upgrade from the electric utility company as part of the Project.

The Design-Builder shall install and have connected power service for new or relocated lighting (sign, roadway, and interchange) for the Project.

The Design-Builder shall provide back-up electrical power service to support Operations and Maintenance Work in emergency situations where the primary power source is not available, where practical.

The power supplies for the Express Lanes ITS Equipment shall be separately metered. The power supplies for existing 95 Express Lanes roadside equipment and infrastructure must remain in service at all times.

Where approved by VDOT and where capacity is available, new Express Lanes lighting, ITS and TMS roadside equipment may be connected to existing VDOT electrical service panels if separately metered.

The Design-Builder shall provide generator back-up power for the operations of the gate systems which includes the reversible gates, the pricing confirmation DMS sign, CCTV cameras, and other Express Lanes ITS if part of the gate system. In addition, the Design Builder shall provide Uninterruptible Power Supply (UPS) back-up power for the operations of the designated Gate DMS and the pricing confirmation DMS.

Vehicle access shall be provided at each generator site for refueling.

Phase taping of electrical conductors shall not be permitted unless approved by the VDOT. Electrical conductors shall have a continuous colored jacket between connection and termination points.

#### **2.9.5.12 Roadway Gates**

Roadway gates shall be designed and installed, including but not limited to tapered lengths and height above finished roadway, to fully close the ramps at all reversible access points such that vehicles cannot go around a closed gate. Installed length of gates shall consider pavement markings, gore areas, and ramp widths. The Design-Builder shall submit a complete gate arm length schedule table for review and approval as a part of the Design Documentation.

A gate cabinet shall be placed at locations where the technician can see the gates while working at the gate cabinet. All gates shall be viewable by at least one PTZ CCTV camera such that the gate open or close position can be visually confirmed by an operator in the EXPRESS-OC and the NRO MPSTOC.

#### **2.9.5.13 Maintenance Access**

All RSE cabinets, foundations, concrete pads, and junction boxes shall be installed at elevations and locations with safe access. Handrails shall be installed for protection at locations with fall hazards.

Junction boxes shall not be installed in roadways, driveways, parking areas, ditches or public sidewalk curb ramps. The Design-Builder shall avoid placing junction boxes in low-lying locations with poor drainage. Electrical junction box length (long side) shall be parallel to the conduit run. When the conduit run is perpendicular to the roadway at the junction point, the junction box shall be parallel to the roadway. The maximum spacing between any two adjacent electrical or communication junction boxes shall be 500 feet.

#### **2.9.5.14 Specified New ITS Roadside Equipment**

New ITS roadside equipment for use on the 95 Express Lanes system shall be the following specified equipment. To ensure the equipment will be compatible with the existing 95 Express Lanes systems, substitutions are not allowed. The following items were approved in the approved certification request form for proprietary products dated February 9, 2016.

Device	Equipment Make/Model	Firmware Version
Generator/Tank with PLC comm from TS&T	Cummins 35GG + Comm Cabinet	latest
Telemetry Remote Terminal Unit	Moxa ioLogic E4200	latest
Telemetry Remote Monitor	Moxa iWatch 100 (SNMP)	latest
Layer 3 Switch	Cisco 3750X-12S-E	latest
Layer 2 Switch	RuggedCom RS900G-HI-D-2SFP-C01	3.12.1
N-Port Device Server	Moxa IA5250A	latest
CCTV (PTZ)	Cohu 3960HD (New pole mount)/HD35-1000	3.02.185
Automatic Incident Detection Camera	Cohu 3930/HD15-1001	1.96.87
Microwave Vehicle Detection	Wavetronix Smart Sensor HD	154.5
DMS (3-line, Freeway) Type b	*Daktronics VF-2420-27x90-66-A	1.9.4588.19
Gate Vertical Rise	B&B VW-4	N/A
170 Controller	VDOT Gate Firmware	VDOT
Uninterruptible Power Supply	Blue Earth UP Stealth UPS (SNMP) (500W Battery)	latest

**Notes:**

\*Firmware version indicates Equipment Make and Model Numbers required for seamless integration into existing Kapsch software

\*DMS type and size shall be verified with the project requirements, design and specifications

\*Generator type and size shall be verified with the project requirements, design and specifications

VDOT supplies gate firmware

### 2.9.5.15 Integration with existing 95 Express Lanes Systems

The Design-Builder shall be responsible for managing and scheduling the work related to the design, procurement, installation, testing, and integration of the Roadside Equipment and related infrastructure, including active coordination and engagement with both VDOT and Transurban throughout the entire project duration. The Design-Builder shall be responsible for ensuring that milestones and all related predecessor activities are being met and reviews are requested from either VDOT or Transurban to meet schedule requirements. Transurban will be responsible for supporting the Design-Builder to complete integration of the Roadside Equipment with the existing traffic and tolling management systems.

### **2.9.5.15.1 Design-Builder and System Integrator Responsibilities**

- Design-Builder Scope
  - Design-Builder shall serve as the Designer of Record and have overall responsibility for management and delivery of the entire Project.
  - Design-Builder shall be responsible for ensuring that the RSE and necessary integration milestones are fully incorporated and integrated into the overall Project schedule.
  - Design-Builder shall be responsible for the interface management necessary to ensure that the civil and integration scopes of work are properly coordinated with other activities.
  - Design-Builder shall be responsible for the design, supply and construction of all civil works necessary for the installation of RSE, including utilities (new service and relocations), drainage, foundations, TMS structures (e.g. poles), roadside cabinets, TMS equipment access points, and roadway barriers required to protect TMS equipment.
  - Design-Builder shall be responsible for the design, supply, installation and on-site testing of TMS RSE, including dynamic messaging signage, microwave vehicle detectors, CCTV cameras, and automated incident detectors.
  - Design-Builder shall be responsible for the design, procurement, installation, testing and commissioning of the fiber optic communications backbone along the entire project length and connections to the Express Lane Operations Center.
  - Design-Builder shall be responsible for design, procurement, installation, testing, and commissioning of all power and communications cabling and network equipment deemed necessary (by Transurban) to support the TMS equipment, structures and roadside cabinets.
  
- Transurban Scope
  - Transurban will be the system integrator with specific and limited responsibilities related to the provision, installation, testing and commissioning of the TMS subsystems.
  - Transurban will be responsible for providing the performance requirements and specifications for the TMS subsystems (including associated roadside equipment) to the Design-Builder.
  - Transurban will be responsible for the final commissioning of the TMS Roadside Equipment, and integrating the TMS Roadside Equipment with the Express Lanes Operations Center and other subsystems.

**2.9.5.15.2 Traffic Management System Scope Clarification Table**

<b>Class</b>	<b>Item</b>	<b>Responsibility</b>	<b>Comment</b>
Civil Works	Utilities	Design-Builder	Service connections and utility relocations necessary to install and operate roadside equipment and associated infrastructure (e.g., lighting, cabinets, etc.)
Civil Works	Other Civil Works	Design-Builder	Necessary drainage, retaining walls, barrier structures, protective structures, equipment access points and parking areas.
Civil Works	Foundations for TMS Sign Structures and Other Equipment Structures	Design-Builder	Footings and conduits necessary for communications and power cabling as per Transurban and Design-Builder provided equipment requirements.
Civil Works	Foundations for TMS Roadside Cabinets.	Design-Builder	Footings and conduits necessary for communications and power cabling as per Transurban and Design-Builder provided equipment requirements.
Telecom & Cabling	Wide Area Communications Network and Cabling (Communications “Backbone”)	Design-Builder	Fiber optic telecommunication network (trunk and distribution) along the full length of the Project, connected to all roadside cabinets. Minimum of two connections from this network to Express Lanes Operations Center.
Telecom & Cabling	TMS Roadside Cabling	Design-Builder	All communications cabling for the TMS devices – from equipment (sensors) mounted on gantries/poles/other to the junction box in the footing of the gantries, then to the technical shelter and/or cabinets. Terminations of TMS equipment within technical shelters or roadside cabinets.
Electrical Power & Cabling	TMS Roadside Equipment Cabling	Design-Builder	Power supply and all distribution cabling and conduits necessary for the operation of the TMS roadside equipment and associated technical shelters and/or cabinets. Includes conduits and cabling from the junction box located in the footing of gantry to the technical shelter and/or cabinets. Placement, layout, and sizing of generators to provide back-up operating power and/or uninterrupted power supply equipment. Final design and installation of associated equipment, including site access.

<b>Class</b>	<b>Item</b>	<b>Responsibility</b>	<b>Comment</b>
TMS Roadside	Overhead and Dynamic Signage	Design-Builder	Placement, layout, sizing, and configuration of overhead and roadside dynamic messaging or pricing signage. Final design and construction of approved signage. Performance specifications, functional requirements and/or minimum quantities provided by Transurban and/or VDOT to be confirmed and finalized by the Design-Builder.
TMS Roadside	Closed Circuit TV Cameras (Pan-Tilt- Zoom)	Design-Builder	Placement, layout, sizing, and configuration of CCTV cameras. Final design, installation, and site-testing of approved cameras configuration. Performance specifications, functional requirements and/or minimum quantities provided by Transurban and/or VDOT to be confirmed and finalized by the Design-Builder.
TMS Roadside	Automated Incident Detectors	Design-Builder	Placement, layout, sizing, and configuration of AID devices. Final design, installation, and site-testing of approved AID configuration. Performance specifications, functional requirements and/or minimum quantities provided by Transurban and/or VDOT to be confirmed and finalized by the Design-Builder.
TMS Roadside	Traffic Sensors and Detectors	Design-Builder	Placement, layout, sizing, and configuration of traffic sensors and detectors. Final design, installation, and site-testing of approved sensor/detector configuration. Performance specifications, functional requirements and/or minimum quantities to be provided by Transurban and/or VDOT.
TMS Roadside	Gantry, Pole and/or Mounting Structures	Design-Builder	Placement, layout and installation of: <ul style="list-style-type: none"> <li>○ TMS Gantries</li> <li>○ Monopoles and/or other mounting structures</li> <li>○ Lighting, including power supply</li> </ul>
TMS Roadside	Testing and Commissioning	Design-Builder	Required testing and commissioning of Design-Builder installed roadside equipment.

<b>Class</b>	<b>Item</b>	<b>Responsibility</b>	<b>Comment</b>
TMS Systems	TMS Delivery and Integration	Transurban	Delivery of TMS, including IT infrastructure and commissioning at the Express Lanes Operations Center. Integration of TMS Roadside Equipment with BOS and ETC systems.
TMS System	Testing and Commissioning	Transurban	Required testing and commissioning of Transurban TMS equipment and systems.
TMS System	Training and Manuals	Transurban	Training and O&M manuals for Transurban-provided equipment and systems
Systems Engineering	Network Architecture and Configuration	Transurban	Systems engineering for TMS systems, including network architecture, configuration management, interface control, and systems integration
System Integration	End-to-end Integration	Transurban	Development, integration and commissioning of the end to end integrated systems.

### **2.9.5.15.3 95 Express Lanes Systems Integration Schedule Requirements**

The following milestones shall be included in the Project Schedule and shall be required to be completed by the following dates:

- 120 Days minimum before Service Commencement – All TMS Roadside Equipment shall be installed and shall have achieved Commissioning.
- 90 Days minimum before Service Commencement – All TMS Roadside Equipment and the Network shall have successfully completed both Level A and Level B Testing.
- 31-90 Days before Service Commencement – The Design-Builder shall provide MOT support and full on-site access to Transurban representatives, including lane and facility closures as approved by VDOT, to assist Transurban in completing the Level C Testing and Burn Period.
- 1-30 Days before Service Commencement – Final operational readiness and VDOT approval for Service Commencement.
- 14 Days before Service Commencement – The Design-Builder shall support necessary customer education, public outreach and Transurban’s operational readiness.

The Design-Builder shall coordinate with Transurban when milestones have been achieved and verified by VDOT. Coordination with Transurban representatives can either be done directly or through VDOT representatives, as determined by the VDOT Project Manager.

Transurban will be under no obligation to accelerate the integration process, Level C testing and Burn Period, due to the inability of the Design-Builder to meet all milestone requirements. All

related work elements and requirements shall be completed for the interim milestone to be successfully achieved.

#### **2.9.5.15.4 Maintenance of 95 Express Lanes Operating Systems**

System shut downs will not be permitted. The Design–Builder shall install all work elements and test the roadside equipment without causing shut downs or outages to the existing 95 Express Lanes system.

For any temporary impacts or isolated shut-down of system elements, the Design-Builder shall coordinate directly with Transurban regarding any work within the 95 Express Lanes, or work impacting any 95 Express Lanes facilities or equipment. An Authorization to Work form, approved by Transurban, shall be required prior to commencing any work within the 95 Express Lanes, or work impacting any 95 Express Lanes facilities or equipment. All Authorization to Work requests shall be submitted a minimum of 5 business days prior to the intended work start date. Directions for submission requirements are contained on the form.

#### **2.9.5.15.5 Impacts to 95 Express Lanes Facilities and Operations**

The Design-Builder shall be responsible for any impact to the existing ITS roadside equipment and infrastructure within the construction limits. Prompt response is required to any damage caused by the Design-Builder and in the event the repair is not completed two hours prior to the next traffic peak, Transurban will use its maintenance Contractor to restore critical systems and charge the Design-Builder accordingly.

The Design-Builder shall reimburse Transurban for the damages caused by the Design-Builder, including but not limited to repair or replacement of the existing fiber and electrical network and the amount of lost revenue. The cost of the repair work performed will include the actual maintenance Contractor costs plus 25% for supervisory and administrative personnel. The amount of lost revenue will be determined based on the average revenue reported for the same period of the outage over the previous four week period.

### **2.9.6 Lighting**

All roadway lighting shall be designed and constructed in accordance with VDOT Traffic Engineering Design Manual, VDOT 2008 Road and Bridge Standards, VDOT Road and Bridge Specifications, and the FHWA Lighting Handbook.

The Design-Builder shall preserve all existing lighting assets along the I-95 Corridor throughout the Construction Period in order to avoid a diminution of the existing lighting conditions for a period of more than 30 days unless otherwise approved by VDOT. The Design-Builder may accomplish this by staging its construction operations for the repair or replacement of existing lighting assets impacted by the Project is completed within 30 days of such assets being taken out of service or otherwise impacted so as to cause a diminution of the existing lighting conditions. If the necessary repair or replacement of an existing lighting asset cannot be completed within the 30

day period, the Design-Builder shall provide, prior to the expiration of the 30 day period, temporary lighting equipment until the completion of the repair or replacement of the existing lighting asset.

A lighting warrant analysis shall be performed and submitted as part of lighting Design Documentation to VDOT for review and approval. The Design-Builder shall verify the RFP Conceptual Lighting Plan and construct lighting where it is warranted. The Design-Builder shall be responsible for controlling light pollution from the proposed lighting, and shall mitigate any such light pollution if requested by VDOT.

All lighting design shall be performed using AGI-32 computer software, and include point-to-point lighting analysis and calculations submitted to VDOT for review and approval.

New or modified lighting shall consist of Partial Interchange Lighting for new or modified entry and exit connections to the Express Lanes. Lighting under the existing Garrisonville Road overpass bridge is not required.

## **2.10 Transportation Management Plan**

The Design-Builder shall prepare a Transportation Management Plan (TMP) in accordance with I&IM-241/TE-351 for all proposed work associated with the Project. The TMP shall document how traffic shall be managed during the construction of the Project. This Project is classified as a Type C, Category V in terms of the TMP. The Design-Builder shall coordinate all work in accordance with the TMP. The phases in the Design-Builder's sequence of construction shall be followed unless the Design-Builder submits and secures VDOT approval for a sequence which will both expedite construction while lessening the effect of such construction upon the traveling public. The TMP shall incorporate and address the elements provided in Part 2, Section 2.10.

### **2.10.1 Maintenance of Traffic**

The Design-Builder's TMP shall include a Maintenance of Traffic (MOT) Plan detailing all phases of work, proposed lane closures, maintenance of traffic through the work area, and all construction accesses for approval by VDOT's Project Manager. This plan shall also address safe and efficient operation of adjacent public transportation facilities and State Highways. The plan shall also include coordination with local agencies and other contractors performing work in the vicinity of I-95. This plan shall reflect the noted Scope of Work and all applicable VDOT Standards and Specifications regarding time of work. All users must be addressed and accommodated in the TMP, including pedestrians, bicyclists, transit vehicles, and other motorists. The TMP shall also accommodate safe and efficient snow removal operations and ensure proper drainage during all phases of construction. Access must be maintained to all businesses, residential communities, and private entrances at all times. The phases in the Design-Builder's suggested sequence of construction that accompany an approved work package shall be followed unless the Design-Builder submits and secures VDOT approval for a sequence which will both expedite construction while lessening the effect of such construction upon the traveling public.

If additional traffic counts are required, it will be the responsibility of the Design-Builder to collect such data. The Design-Builder shall note that any proposed detour utilizing local neighborhood streets that are maintained by VDOT will require the coordination with the applicable locality, as appropriate, and are subject to the terms and conditions of VDOT's approval.

Construction signs and pavement markings (temporary) shall be installed, maintained, adjusted, and removed by the Design-Builder throughout the duration of the Project. These items shall be shown on and coordinated with the Sign Sequencing Plan defined in Part 2, Section 2.9.1.2. If the Design-Builder chooses to remove any existing pavement markings from any roadway to install temporary markings to facilitate his work, the Design-Builder shall resurface the roadway in accordance with Part 2, Section 2.6.1.

All entrances, intersections or pedestrian access points/routes that will be affected by the work zone or by the traffic control devices shall be maintained or an acceptable alternate must be provided by the Design-Builder.

Temporary barriers shall be shown in the MOT Plans and shall be in accordance with the documents in Part 2, Section 2.1.1 and the provisions of Part 2, Section 2.9.3. If Traffic Barrier Service Concrete (TBSC) is warranted based on the criteria for determining the application of barrier per the 2011 (revised April 2015) Work Area Protection Manual and a completed Engineering and Traffic Investigation-Work Zone Channelization/Barrier Analysis, the guidelines provided in the Roadway Design Manual and IIM-LD-93 shall be utilized.

## **2.10.2 Incident Management Plan**

Any field work performed which impacts travel lanes or shoulders, including but not limited to construction, geotechnical investigations, and survey, shall have an incident management plan developed and approved by VDOT prior to the start of field work.

During incidents that close one or more lanes on Interstate 95, all lane closures shall be removed and all travel lanes fully opened to traffic in the same direction as the incident on Interstate 95, 95 Express Lanes, and the interchange ramps. An incident shall be defined as any condition (including contractor work operations) that cause a traffic queue extending greater than five (5) miles on Interstate 95 between the hours of 5:00AM to 9:00PM or greater than six (6) miles on Interstate 95 during all other hours. The queue length shall be measured starting at the Road Work Ahead signs.

As part of the TMP, the Design-Builder shall submit an Incident Management Plan (IMP) for review and approval by VDOT. The intent of the IMP is to be prepared for incidents along the construction corridor. The Design-Builder shall coordinate with appropriate VDOT, EMS, and stakeholders during the development of the plan and hold a stakeholder meeting to brief them on the IMP. The IMP shall address at a minimum the following with respect to incident management:

- 24/7 point of contact for emergency notification of incident by TOC;
- Emergency detour routes and sign layout plans in addition to TMP signage;
- Agency and stakeholder Responsibilities Matrix/Checklist;
- Pre-staged detour equipment and material needs (i.e.; barrels, portable message boards, signage, etc.) as defined in the sign layout plans that shall be provided by the Design-Builder;
- Coordination with VDOT Northern Virginia TOC;
- Coordination with Transurban's Express Operations Center for any incidents on or impacts to the 95 Express Lanes
- Signage of emergency detour routes;
- Coordination with 1st responders and stakeholders;
- Law Enforcement, Fire, and Rescue access to the road network during incidents;
- Pre-planned Messages for various types of incidents for the portable DMS; and
- Contact list for appropriate stakeholder response personnel.

As part of the IMP, the Design-Builder shall work with the appropriate VDOT personnel to coordinate wrecker service to remove disabled vehicles within the Project limits.

The Design-Builder shall coordinate with VDOT and localities to determine allowable alternate routes and detours. The Design-Builder shall be responsible for all detour signage and traffic control measures required. As necessary, this work shall extend beyond the defined Project limits. Proposed changes to signal timing for any signals on detour routes shall be coordinated with the respective signal owner.

Upon notification from the Department of an incident requiring a detour, the Design-Builder shall establish the detour within one hour from 5 AM-9 PM daily. The Design-Builder shall establish the detour within two hour during all other times not referenced.

The Design-Builder shall coordinate with the VDOT NRO and Transurban's Express Operations Center. Incident times shall be based on those recorded at the Northern Virginia TOC Traffic Management System.

### **2.10.3 Lane and Road Closure Restrictions**

VDOT acknowledges that temporary lane closures may occasionally be required; however, temporary lane closures are only allowed at the sole discretion of VDOT when necessary to ensure the safety of the traveling public and no practical alternative exists. Offeror's Technical and Price Proposals shall be developed to meet the required lane, shoulder, or road closure restrictions specified in this section. Any deviations from these allowable lane closures may render an Offeror's Proposal non-responsive.

Lane, shoulder, or road closures shall be detailed in the Design-Builder's Transportation Management Plan. Anticipated and proposed temporary lane and/or shoulder closures shall be reviewed and approved by VDOT. The Design-Builder shall restore all lanes of traffic per the times specified in this section. Restoration of traffic shall mean the completion of all construction work, the removal of all traffic control devices, signs, workers, materials, and equipment from the roadway.

### **Restriction of Operations:**

In addition to the allowable lane closure hours specified in the tables below, the restrictions listed shall be followed.

#### **1. 95 Express Lanes**

For any temporary impacts or isolated shut-down of system elements, the Design-Builder is required to coordinate directly with Transurban regarding any work within the 95 Express Lanes, or work impacting any 95 Express Lanes facilities or equipment. An Authorization to Work form, approved by Transurban, will be required prior to commencing any work within the 95 Express Lanes, or work impacting any 95 Express Lanes facilities or equipment. All Authorization to Work requests shall be submitted a minimum of 5 business days prior to the intended work start date. Directions for submission requirements are contained on the form (available from the Express Lanes Operations Center at (571) 419-6046.

Use of the Southbound Garrisonville flyover to access the Express Lanes at any time shall not be permitted.

#### **2. Holiday**

In addition to the Sunday or Holiday work limitations, mobile, short duration, short-term stationary, or intermediate-term stationary temporary traffic control zone lane closures on mainline lanes, shoulders, or ramps shall not be performed during the following Holiday time periods without the written permission of the Engineer. Additionally, a long-term stationary temporary traffic control zone shall not be initially put in place, adjusted, or removed during the following Holiday time periods without the written permission of the Engineer (VDOT 2007 Standard Specifications, updated 12/2014):

- **January 1:** From 5:00 a.m. on the preceding day until Noon on the following day, except as indicated below.
- **Inauguration Day:** From 3:30 p.m. on the preceding day until 9:30 a.m. on the following day.
- **Martin Luther King, Jr. Day and Lee Jackson Day:** From 5:00 a.m. on the preceding Thursday to Noon on the following Tuesday.
- **Presidents Day:** As indicated below.
- **Easter:** As indicated below.

- **Memorial Day:** As indicated below.
- **July 4:** From 5:00 a.m. on the preceding day until Noon on the following day, except as indicated below.
- **Labor Day:** As indicated below.
- **September 11:** No daytime closures.
- **Columbus Day:** As indicated below.
- **Veterans Day:** From 5:00 a.m. on the preceding day until Noon on the following day, except as indicated below.
- **Thanksgiving Day:** From 5:00 a.m. on the Wednesday preceding Thanksgiving Day until Noon on the Monday following Thanksgiving Day.
- **Christmas Day:** From 5:00 a.m. on the preceding day until Noon on the following day, except as indicated below.

**If the Holiday occurs on a Friday or Saturday:** From 5:00 a.m. on the preceding Thursday to Noon on the following Monday.

**If the Holiday occurs on a Sunday or Monday:** From 5:00 a.m. on the preceding Friday to Noon on the following Tuesday.

<b>INTERSTATE 95 – Allowable Lane Closure Times (September to April)</b>			
<b>DAY</b>	<b>Northbound (Excluding 95 Express Lanes reversible facility)</b>		
	<b>Single-Lane Closures or Shoulder**</b>	<b>Two-Lane Closures</b>	<b>Complete Road* Closure</b>
<b>Monday – Thursday</b>	12:00 Midnight to 4:30AM 9:30AM to 3:30PM 9:00PM to 11:59PM	12:00 Midnight to 4:30AM 10:00PM to 11:59PM	12:00 Midnight to 3:00AM
<b>Friday</b>	12:00 Midnight to 4:30AM 10:00PM to 11:59PM	12:00 Midnight to 4:30AM	12:00 Midnight to 3:00AM
<b>Saturday – Sunday</b>	12:00 Midnight to 7:00AM	Not Permitted	Not Permitted
<b>DAY</b>	<b>Southbound (Excluding 95 Express Lanes reversible facility)</b>		
	<b>Single-Lane Closures or Shoulder**</b>	<b>Two-Lane Closures</b>	<b>Complete Road* Closure</b>
<b>Monday – Thursday</b>	12:00 Midnight to 10:00AM 9:00PM to 11:59PM	12:00 Midnight to 4:30AM 10:00PM to 11:59PM	12:00 Midnight to 3:00AM
<b>Friday</b>	12:00 Midnight to 6:00AM 10:00PM to 11:59PM	12:00 Midnight to 4:30AM	12:00 Midnight to 3:00AM
<b>Saturday – Sunday</b>	12:00 Midnight to 7:00AM	Not Permitted	Not Permitted

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<b>INTERSTATE 95 – Allowable Lane Closure Times (May to August)</b>			
<b>DAY</b>	<b>Northbound (Excluding 95 Express Lanes reversible facility)</b>		
	<b>Single-Lane Closures or Shoulder**</b>	<b>Two-Lane Closures</b>	<b>Complete Road* Closure</b>
<b>Monday – Thursday</b>	12:00 Midnight to 4:30AM 9:00PM to 11:59PM	12:00 Midnight to 4:30AM 10:00PM to 11:59PM	12:00 Midnight to 3:00AM
<b>Friday</b>	12:00 Midnight to 4:30AM 10:00PM to 11:59PM	12:00 Midnight to 4:30AM	12:00 Midnight to 3:00AM
<b>Saturday – Sunday</b>	12:00 Midnight to 5:00AM	Not Permitted	Not Permitted
<b>DAY</b>	<b>Southbound (Excluding 95 Express Lanes reversible facility)</b>		
	<b>Single-Lane Closures or Shoulder**</b>	<b>Two-Lane Closures</b>	<b>Complete Road* Closure</b>
<b>Monday – Thursday</b>	12:00 Midnight to 7:00AM 9:00PM to 11:59PM	12:00 Midnight to 4:30AM 10:00PM to 11:59PM	12:00 Midnight to 3:00AM
<b>Friday</b>	12:00 Midnight to 4:30AM 10:00PM to 11:59PM	12:00 Midnight to 4:30AM	12:00 Midnight to 3:00AM
<b>Saturday – Sunday</b>	12:00 Midnight to 5:00AM	Not Permitted	Not Permitted

<b>Route 1 – Allowable Lane Closure Times</b>			
<b>DAY</b>	<b>Northbound Single-Lane Closures**</b>	<b>Southbound Single-Lane Closures**</b>	<b>Complete Road* Closure</b>
<b>Monday – Thursday</b>	12:00 Midnight to 5:00AM 10:00PM to 11:59PM	12:00 Midnight to 7:00AM 8:00PM to 11:59PM	Not Permitted
<b>Friday</b>	12:00 Midnight to 5:00AM 10:00PM to 11:59PM	12:00 Midnight to 7:00AM 10:00PM to 11:59PM	Not Permitted
<b>Saturday – Sunday</b>	12:00 Midnight to 7:00AM 10:00PM to 11:59PM	12:00 Midnight to 7:00AM 10:00PM to 11:59PM	Not Permitted
<b>All Other VDOT Roadways*** - Allowable Lane Closure Times</b>			
<b>DAY</b>	<b>Single-Lane Closures**</b>	<b>Complete Road* Closure</b>	
<b>Monday – Sunday</b>	12:00 Midnight to 6:00AM 9:00AM to 3:30PM 7:00PM to 11:59PM	Not Permitted	

\*Complete Road Closures: 20 minutes maximum or a time frame approved by VDOT to facilitate the erection or removal of overhead sign panels.

\*\* Single-lane closures are only permitted for multiple-lane roadways; long-term closures of the shoulders adjacent to the GP Lanes are allowable pursuant to VDOT approval.

\*\*\* Other roadway closures will require coordination and possibly permitting with the agency having jurisdiction over the roadway. Major arterials are defined as primary routes and all other routes that connect directly to Interstate I-95.

<b>95 EXPRESS LANES – Allowable Lane Closure Times</b>		
<b>REVERSIBLE LANES (95 EXPRESS LANES South of MM 145.7)*</b>		
	<b>Single-Lane Closures or Shoulder</b>	<b>Complete Road Closure**</b>
<b>MONDAY-THURSDAY</b>	9:00PM to 4:30AM	Only permitted when Express Lanes are operating in the NB direction (NB operation typically between 1:00 a.m. and 11:00 a.m.)
<b>FRIDAY - SUNDAY</b>	11:00PM Friday to 4:30AM Monday	Only permitted when Express Lanes are operating in the NB direction (NB operation typically from 3:00 p.m. Sat until 11:00 a.m. Mon)
* Direction of traffic control for all lane closures in reversible lanes will need to be adjusted as necessary to face direction of traffic.		
** Complete Road Closure on Express Lanes for 30 minutes or less		

<b>REVERSIBLE LANES (95 EXPRESS LANES North of MM 145.7)*</b>		
	<b>Single-Lane Closures or Shoulder</b>	<b>Complete Road Closure**</b>
<b>MONDAY-THURSDAY</b>	9:00PM to 4:30AM	12:00AM to 4:00AM
<b>FRIDAY-SUNDAY</b>	11:00PM Friday to 4:30AM Monday	12:00AM to 4:00AM
* Direction of traffic control for all lane closures in reversible lanes will need to be adjusted as necessary to face direction of traffic.		
** Complete roadway closure 30 minutes maximum or a time frame approved by VDOT and Transurban only to facilitate the erection and removal of overhead sign panels or sign structures		

These allowable hours shall be applicable to both stationary and mobile lane closures, as well as shoulder closures. VDOT will consider changes to the allowable lane closure hours only if the Design-Builder can demonstrate why the proposed work cannot be completed within the contract allowable lane closure hours. All requests shall include an assessment of the work zone traffic impacts using a sketch planning traffic analysis tool and/or an operational level traffic analysis software program as appropriate for approval by VDOT at least 30 days prior to the operation impacting the lanes.

Two-lane closures and total closures of I-95 for such work as installation and removal of overhead sign panels and structures with substantiation of need by the contractor will require coordination with appropriate stakeholders and public notice. The Design-Builder shall provide a minimum of four (4) weeks advance notice to VDOT (this shall include the District Construction Engineer, Regional Operations Director, and District Communications Manager). This advance notice will allow the Design-Builder and VDOT to coordinate on a public outreach campaign and/or advertising to reach affected motorists and target audiences. Alternate dates can be advertised in the event of inclement weather.

The Design-Builder shall submit all lane and/or shoulder closure requests to the VDOT TOC and VDOT Project Manager for coordination purposes (for determination of conflicts with other projects, for instance) at least seven (7) days in advance of the proposed lane and/or shoulder closure and no later than close of business Wednesday the week prior to closure, stating the location, purpose, date, time, and duration of the closure. The Design-Builder shall confirm at least twenty-four (24) hours before any scheduled lane and/or shoulder closure and shall include a written reiteration of the proposed tasks and a listing of materials, labor, and equipment to be utilized, in order for TOC to post the information on the VDOT website and VA511 system.

The Design-Builder is responsible for providing advance notification via variable message and required static signing for lane and/or shoulder and complete road closures in accordance with the 2011 (revised March 2015) Virginia Work Area Protection Manual and the *Manual on Uniform Traffic Control Devices* (MUTCD). Once a closing is in place, work shall commence immediately and shall progress on a continuous basis to completion or to a designated time.

If the Design-Builder is unable to remove the lane and/or shoulder closure by the stipulated time, the Design-Builder will not be allowed further lane closures until the reasons for the failure are evaluated and the Design-Builder can provide assurance that the causes have been corrected. A formal submission as to the reasons for the failure to restore traffic lanes within the contract lane closure restrictions and the proposed corrective measures is to be provided to the VDOT Construction Manager within two (2) days of the occurrence. VDOT will respond to the adequacy of the submission within two (2) working days of receipt. No consideration for extension of time and no additional compensation will be granted for these days.

VDOT reserves the right to monitor traffic conditions impacted by the work and to make additional restrictions as may be necessary or as emergency situations dictate. Additional restrictions for other holidays or special local events may be necessary, however, in these situations VDOT will endeavor to inform the Design-Builder at the earliest and in no case less than forty-eight (48) hours prior to the event.

During the Construction Phase, the Design-Builder shall provide an emergency contact list of project personnel for internal use and have sufficient manpower and resources available to respond to any onsite emergency, including any work zone incidents.

**2.10.4 Damage Recovery**

Damage recovery/user costs will be assessed against the Design-Builder if all lanes are not open to traffic by the time required in the approved request for temporary lane closure. Costs will be assessed as follows and continue until all lanes are opened as determined by the VDOT Project Manager. This assessment will be in the following table:

<b>Damage Recovery for Lane Closures</b>				
<b>Elapsed Time (min)</b>	<b>Damage Recovery* (\$ per minute)</b>			
	<b>I-95 GP Lanes Northbound</b>		<b>I-95 GP Lanes Southbound</b>	
	<b>Single</b>	<b>Double</b>	<b>Single</b>	<b>Double</b>
1-5, or any portion thereof	\$0	\$0	\$0	\$0
Every additional minute or any portion thereof after initial 5 minutes stated above	\$7,000 plus \$1,400 per each additional minutes	\$7,000 plus \$5,600 per each additional minutes	\$12,500 plus \$2,500 per each additional minutes	\$12,500 plus \$10,000 per each additional minute
Maximum damages allowable per each 24 hour period	\$220,000	\$500,000	\$360,000	\$500,000

(\*) Applicable to Non-Permitted Closures for the General Purpose Lanes only. If a Non-Permitted Closure occurs, the Department will notify the Design-Builder thereof and of the amount of associated Lane Closure Damages in writing within 48 hours of the Non-Permitted Closure. If there are no additional Non-Permitted Closures occurring within 90 days, the Department shall refrain charging of the Lane Closure Damages for the prior Non-Permitted Closures. Otherwise, the Design-Builder shall pay all Lane Closure Damages to the Department within 30 days of the date on which last written notice of Lane Closure Damages is given to the Design-Builder for violating two (2) or more Non-Permitted Closure occurrences within 90 days. Once there is a clean period of 90 days without a Non-Permitted Closure occurrence, the new 90 days period will start for future Lane Closure Damages. All liquidated damage charges will be capped daily at the values shown above per violated Non-Permitted Closure.

Non-Permitted Closure: Any lane closure outside the Technical Requirements unless approved by VDOT

Additionally, damage recovery/user costs will be assessed against the Design-Builder by the Department (in coordination with 95 Express Lanes LLC) if all lanes are not open to traffic by the designated times above or if a lane closure is implemented prior to the designated times above. Costs will be assessed as follows and continue until all lanes are opened and the 95 Express Lanes are returned to normal operations as determined by the VDOT Project Manager. This assessment will be in the following table:

Elapsed Time (min)	95 Express Lanes
1-5, or any portion thereof	\$0
Every additional minute or any portion thereof after initial 5 minutes stated above	Value of lost revenue* (lost revenue calculation shall include initial 5 minutes)

\* Amount shall equal the lost revenue for the duration of the lane closure, based on the average revenue reported for the same 15 minute periods over the previous 4 weeks. Damage recovery/user costs will be assessed in all instances and the Design-Builder shall pay all Damage Recovery amounts within 30 Days of the date of the written notice of damage recovery.

If the Design-Builder is assessed these damage recovery/user fees for failure to restore traffic lanes, the Design-Builder will not be allowed further lane closures until the reason for the failure are evaluated and the Design-Builder can provide assurance that the causes have been corrected. A formal submission as to the reasons for the failure to restore traffic lanes within the contract lane closure restrictions and the proposed corrective measures is to be provided to the VDOT Project Manager within two (2) days of the occurrence. No modification of the Contract Price or Contract time(s) will be granted or considered for these days.

VDOT may, at its sole discretion, waive damage recovery/user fees for failure to open traffic if such cause is not related to or caused by the Design-Builder’s operations. The Design-Builder shall catalog user cost assessments on a daily basis and submit a tabulation along with certification from the QAM that such tabulation is correct to the VDOT Project Manager for concurrence. The Department will make a deduction in the assessed amount from Progress Payment funds otherwise due to the Design-Builder. After Final Completion, the VDOT Project Manager will initiate an adjustment to the Contract Price in accordance with Article 9 of Part 4 to consider all damage recovery/user cost assessments.

**2.10.5 Allowance for Additional Lane Closure Restrictions by the Department and/or Design-Builder Requests for Additional Lane Closures**

At the Department’s reasonable discretion and approval, the Design-Builder may submit a request to Work outside the stated lane closure hours by providing adequate justification (including traffic analysis) demonstrating the viability of the request.

Closures of longer durations than those listed in the tables in Part 2, Section 2.10.3 will require a review of plans, implementation of detours, and public outreach.

**2.10.5.1 General Requirements**

The Department will track any additional lane closure time granted outside of time allowed in the tables in Part 2, Section 2.10.3

Any additional time granted by the Department must comply with the technical requirements set forth in Part 2, Section 2.10.

The Design-Builder acknowledges that there will be instances where the Design-Builder may not be allowed to implement an approved lane closure during events that are beyond the

Department's control.

### **2.10.5.2 Calculating Hours**

Additional time (lane closures) – Any additional time requested by the Design-Builder and granted by the Department beyond the approved hours set forth in the RFP Documents will be added for every instance and every location at fifteen (15) minute intervals.

Additional Time (complete closures) – If a full closure of a roadway not specified in the RFP Documents is implemented in lieu of thirty (30) minute total temporary closure, hours will be calculated in the same manner as the hours that were requested/approved for the specific closure.

Time Deducted – When the Design-Builder is not allowed to implement a lane closure by the Department during the approved hours set forth in the tables in Part 2, Section 2.10.3, the hours during which such lane closure is not allowed will be deducted from the total hours accumulated.

### **2.10.5.3 Documentation**

Within the first sixty (60) days, the Department and the Design-Builder will develop and agree on a format of documenting this information. The documentation shall at a minimum consist of the date, hours allowed, hours disallowed, and impacted time.

By the 10th day of each month, the Department and the Design-Builder will reconsolidate and agree on the resultant amount of hours allowed/disallowed.

### **2.10.5.4 Allowance**

At the end of the Project, the Department and the Design-Builder will reconcile the resultant impacted time or additional granted time by subtracting the additional time granted by the Department from the time Design-Builder was disallowed per the technical requirements set forth in Part 2, Section 2.10 to implement the lane closures. The Department and the Design-Builder will endeavor to maintain a neutral balance of resultant impacted and additional granted time throughout the duration of the Project.

Any lane closures affected by inclement weather, snow and snow removal process, emergency VDOT maintenance repairs safety shutdowns, and from major accidents are not subject to above allowance and are excluded from the calculations and compensations.

### **2.10.5.5 General:**

Notwithstanding anything to the contrary, it is agreed that:

- The Department will provide the Design-Builder with as much notice as is possible with respect to any lane closure request by the Design-Builder which is not approved by the Department.

- The Design-Builder will provide the Department with as much notice as is possible with respect to any inability of the Design-Builder to implement lane closures which are otherwise allowed as set forth in the tables in Part 2, Section 2.10.3.
- If the Department disapproves requests for lane closures from the Design-Builder, or otherwise prevents the Design-Builder from implementing lane closures which are otherwise permitted in the tables in Part 2, Section 2.10.3, and the impact of such actions by the Department is more than one hundred twenty (120) cumulative hours, such actions shall constitute a Department Change.

At the end of the Project, the Department and the Design-Builder will reconsolidate the impacted time by subtracting the additional time granted by the Department from the time the Design-Builder was disallowed per the technical requirements to implement the lane closures. If the Department disproves requests for lane closures from the Design-Builder, or otherwise prevents the Design-Builder from implementing lane closures which are permitted by the RFP Documents, and the impact of such actions by the Department is more than 120 cumulative hours, then such actions shall be addressed through the work order process per Article 9 (Changes to the Contract Price and Time) or Article 10 (Contract Adjustments and Disputes).

#### **2.10.5.6 Special Events**

The Design-Builder will be cognizant of and compliant to traffic demands during special events. Construction activities and/or lane closures that will affect event traffic may be stopped early or not allowed to implement a closure for special events such as, but not limited to, the following list:

- Presidential motorcades traveling through Project limits
- Special events with regional impacts
- Special sport events with regional impacts
- Major accidents/incidents with regional impacts
- Holiday and/or seasonal traffic patterns
- Natural or other disasters requiring regional evacuations

#### **2.10.6 Use of Virginia State Police**

The Design-Builder shall be responsible for coordinating through VDOT for Virginia State Police (VSP) service during Temporary Traffic Control operations involving lane closures and/or rolling lane closures, and any other operation as covered in Appendix C of the Virginia Work Area Protection Manual. VDOT shall be responsible for all costs incurred by VSP specific to the Project.

All lane and rolling lane closures shall be identified in the TMP and shall be in accordance with the Virginia Work Area Protection Manual, latest edition.

#### **2.10.7 Portable Changeable Message Signs**

Portable Changeable Message Signs (PCMS's) shall be used in advance of the work zone

when closing or shifting lanes within the Project limits. The Design-Builder shall provide at least eight (8) PCMS's, which are to be placed in various locations as approved by the Department and included in the TMP. PCMS's shall have the capability to be remotely controlled from the Transportation Operations Center (TOC) to facilitate emergency access during an incident. PCMS's shall also be used to provide en-route travel information about planned construction, delays or other sudden changes in travel conditions throughout the Project's duration. The PCMS shall be placed in a semi-permanent location, protected from traffic but highly visible to the public. The Design-Builder shall coordinate the implementation of PCMS's with VDOT. The use of PCMS's shall not replace any traffic control device otherwise required per the MUTCD or the Virginia Work Area Protection Manual.

### **2.10.8 Travel on the 95 Express Lanes**

No toll exemptions shall be applied nor toll notices written off due to the Design-Builder's travel on the 95 Express Lanes related to work on this project.

### **2.11 Public Involvement / Public Relations**

The Design-Builder shall support the Department on Public Involvement activities associated with media requests, elected official's meetings, and other project meetings. Typical support activities shall include providing displays, boards, and project information for public meetings and meeting with officials, as well as attendance at these meetings with key personnel. Project information shall also be provided for periodic public status updates, the Department and Transurban's websites, and media requests.

The Design-Builder shall be fully responsible for all communications, correspondence, and coordination with homeowners and businesses for design and construction of the noise walls. Typical activities shall include, at a minimum, notifications, letter writing, voting, and conducting meetings.

### **2.12 Right of Way**

There are no anticipated right-of-way impacts proposed by this Project as shown on the RFP Conceptual Plans included in the RFP Information Package, with the exception of temporary or permanent easements (including utility easements) that have not yet been identified or shown on the RFP Conceptual Plans. Should right-of-way (whether fee or easements) be required to accommodate Design-Builder's unique solution and/or Design-Builder's means, methods, and resources used during construction above and beyond the right-of-way limits depicted on the RFP Conceptual Plans, then all right-of-way acquisition costs for such additional fee or easements shall be paid by the Design-Builder. These costs would include (but not be limited to) the costs of any public hearings that may be required, actual payments to property owners and all expenses related to the additional acquisitions and associated legal costs, as well as any additional monies paid to the landowners to reach a settlement or pay for court award. In the event additional right-of-way is needed as a result of an approved scope change request by the Design-Builder, the Design-Builder shall follow the procedures indicated in the VDOT's Right of Way Manual of Instructions, 3<sup>rd</sup> Edition, FHWA update approved January 1, 2016. Additionally, the Design-Builder is solely responsible for any schedule delays due to additional right-of-way acquisition associated with the Design-Builder's design

changes; no time extensions shall be granted.

### **2.13 Utilities**

All efforts and costs necessary for all utility designations, utility locates (test holes), conflict evaluations, cost responsibility determination, utility relocation designs, utility relocations and adjustments, utility reimbursements, replacement land rights acquisition and utility coordination shall be included in the Offeror's Price Proposal. Costs for any utility betterment(s) shall not be included in the Offeror's Price Proposal but shall be reimbursed to the Design-Builder through agreement with the requesting utility owner.

Utility information provided on the RFP Conceptual Plans identifies all known utilities, at the time of plan development, that are located within the Project limits. Aerial utilities are identified on the RFP Conceptual Plans and/or in the Survey files by the structure to which they are attached. However, it is the Offeror's responsibility to verify, to their satisfaction, the owner, type, size, height and number of cables attached to the structure when preparing their Price Proposal. Underground utility data South of the Garrisonville Road overpass was obtained and is depicted in accordance with CI/ASCE 38-02 SUE Quality Level B designation on the RFP Conceptual Plans and/or Survey files. However, it is the Offeror's responsibility to verify, to their satisfaction, the owner, type, size, number of cable/conduits, pipes, services, and horizontal and vertical (depth) location of underground utilities to include service connections and laterals with the utility owners when preparing their Price Proposal.

The Design-Builder shall be responsible for all utility designations, utility locates (test holes), conflict evaluations, cost responsibility determinations, utility relocation designs, utility relocations and adjustments, utility reimbursement, replacement land rights acquisition, utility coordination, and coordination of utility betterments required for the Project. The Design-Builder shall be responsible for all necessary utility relocations, adjustments, and betterments to occur in accordance with the accepted Baseline Schedule.

The Design-Builder shall be responsible for new utility service connections, including full coordination with the utility owners and payment of connection fees. The Design-Builder shall also be responsible for paying the monthly utility bills associated with new service panels, up to and including the date of final project completion. Service shall be transferred to either VDOT or Transurban, as applicable, upon the final completion date.

The Design-Builder shall be responsible for coordination of the Project construction with all utility owners that may be affected. The Design-Builder shall be responsible for coordinating the work of the Design-Builder, its subcontractors, and the various utilities. The Design-Builder shall initiate early coordination with all utility owners with facilities located within the Project limits. The resolution of any conflicts between utilities and the construction of the Project shall be the responsibility of the Design-Builder. No additional compensation or time will be granted for any delays, inconveniences, or damage sustained by the Design-Builder or its subcontractors due to interference from utility owners or the operation of relocating utilities or betterments.

The Design-Builder shall make all reasonable efforts to design the Project to avoid conflicts with utilities, and minimize impacts where conflicts cannot be avoided.

The Design-Builder shall identify and acquire any replacement utility easements or required right of way needs of all utilities necessary for relocation due to conflicts with the Project.

Utility owners and their respective contact information that are known to the Department are provided below for reference only. It is the Design-Builder's responsibility to verify whether other utility owners exist within the Project limits and coordinate with them.

*Columbia Gas  
4176 Bludau Dr  
Warrenton, VA 20186  
Contact: Nicholas Lewis  
Telephone: 540-349-2924*

*Comcast  
1128 Garrisonville Road  
Stafford, VA 22556  
Contact: Gary Folden  
Telephone: 540-834-4907*

*Dominion Virginia Power - Distribution  
3072 Centreville Rd  
Herndon, VA 20171  
Contact: Gregory Sye  
Telephone: 571-203-5152*

*Dominion Virginia Power - Transmission  
3072 Centreville Rd  
Herndon, VA 20171  
Contact: Gary Dorman  
Telephone: 571-203-5085*

*MCB Quantico - Public Works Branch  
2004 Barnett Avenue  
Quantico, VA 22134  
Contact: Joe Winterer  
Telephone: 703-784-5530*

*Stafford County Utilities Dept  
2128 Jefferson Davis Highway  
Suite 101/103  
Stafford, VA 22555  
Contact: Dale Allen  
Telephone: 540-658-8616*

*Summit IG*

*22375 Broderick Drive  
Dulles, VA 20166  
Contact: Chip Turner  
Telephone: 703-376-3703*

*VDOT  
6363 Walker Lane, Suite 500  
Alexandria, VA 22310  
Contact: Dave Smallwood  
Telephone: 703-334-0208*

*Verizon  
9401 Peabody Street  
Manassas, VA 20110  
Contact: Bill Lacy  
Telephone: 703-369-9571*

The Design-Builder shall provide all utility owners with roadway design plans as soon as the plans have reached a level of completeness adequate to allow them to fully understand the Project impacts. The utility owners will use the Design-Builder's design plan for preparing relocation plans and estimates. If a party other than the utility owner prepares relocation plans, there shall be a concurrence box on the plans where the utility owner signs and accepts the relocation plans as shown.

The Design-Builder shall coordinate and conduct a preliminary utility review meeting with all affected utility owner to assess and explain the impact of the Project. VDOT's Project Manager and VDOT's Regional Utilities Manager/Design-Build Projects Utility Coordinator (or designee) shall be included in this meeting.

The Design-Builder shall verify the prior rights of each utility owner's facilities if claimed by a utility owner. If there is a dispute over prior rights with a utility, the Design-Builder shall be responsible for resolving the dispute. The Design-Builder shall prepare and submit to VDOT a Preliminary Utility Status Report within one hundred and twenty (120) days from the Date of Notice to Proceed that includes a listing of all utilities located within the Project limits and a conflict evaluation and cost responsibility determination for each utility. This report shall include copies of existing easements, As-Built plans or other supporting documentation that substantiates any compensable rights of the utility owner.

The Design-Builder shall obtain the following from each utility owner that has a utility located within the Project limits: relocation plans including letter of "no cost" where the utility owner does not have a compensable right; utility agreements including cost estimate and relocation plans where the utility owner has a compensable right; or letters of "no conflict" where the utility owner's facilities will not be impacted by the Project.

The Design-Builder shall review all relocation plans to ensure that relocations comply with the current editions of the VDOT Utilities Manual of Instruction, the Utility Relocation Policies and Procedures and the VDOT Land Use Permit Manual. The Design-Builder shall also ensure that there are no conflicts with the proposed roadway improvements and ensure that there are no conflicts

between each of the utility owner's relocation plans. The Design-Builder shall prepare and submit to VDOT all relocation plans. The Design-Builder is expected to assemble the information included in the relocation plans in a final and complete form and in such a manner that VDOT may approve the submittals with minimal review. The Design-Builder shall meet with VDOT's Regional Utilities Manager/Design-Build Projects Utility Coordinator (or designee) within forty-five (45) days from the date of Notice to Proceed to gain a full understanding of what is required with each submittal. The Design-Builder shall receive written approvals from VDOT prior to authorizing utilities to commence relocation construction. The utility owners shall not begin their relocation work until authorized by the Design-Builder. Each relocation plan submitted must be accompanied by a certification from the Design-Builder stating that the proposed relocation will not conflict with the proposed roadway improvement and will not conflict with another utility owner's relocation plan.

At the time the Design-Builder notifies VDOT that the Design-Builder deems the Project to have reached Final Completion, the Design-Builder shall certify to VDOT that all utilities have been identified and conflicts have been resolved and that those utility owners with compensable rights or other claims related to relocation or coordination with the Project have had their facilities relocated and their claims and compensable rights satisfied or will be satisfied by the Design-Builder.

The Design-Builder shall ensure the utility owners submit As-Built drawings upon completion of their relocation and/or adjustments. VDOT will issue an as-built permit to the utility owners after receipt of the permit application and the As-Built drawings. The Design-Builder shall accurately show the final location of all utilities on the As-Built drawings for the Project in accordance with Part 2, Section 2.16.9 of the RFP.

#### **2.14 Quality Assurance / Quality Control (QA/QC)**

The Design-Builder shall submit its Quality Assurance/Quality Control (QA/QC) for both design and construction to VDOT at the meeting held after the Date of Commencement as set forth in Part 4 General Conditions under Part 2, Section 2.1.2. Along with the QA/QC Plan submittal, the Design Manager and Quality Assurance Manager (QAM) shall provide a presentation of the QA/QC Plan for both design and construction utilizing Project related scenarios. Project scenarios shall include, but not be limited to:

- Preparatory Inspection Meeting requirements, including incorporation of at least one each, Witness and Hold Point, as set forth in Sections 5.3 and 5.14 of the Department's guidance document for Minimum Requirements for Quality Assurance and Quality Control on Design-Build and Public-Private Transportation Act Projects, January 2012 (January 2012 QA/QC Guide);
- At least one (1) material which VDOT retains responsibility for testing as identified in Table 5-2, January 2012 QA/QC Guide;
- Situation arising requiring the issuance of a Non-Conformance Report and subsequent review of the report, including completion of corrective measures and the issuance of a Notice of Correction of non-conformance work with proper log entries and proper interface with auditing and recovery requirements as set forth in Sections 5.10 and 5.11 of the January 2012 QA/QC Guide for non-conforming work resulting from:

- defective equipment
- construction activities/materials which fail to conform as specified;
- Inspection documentation capturing requirements as set forth in Section 5.20 and 5.21 of the January 2012 QA/QC Guide; as well as inspection of foundation and pavement subgrades that are to be performed and certified by the Design-Builder's licensed geotechnical engineer in accordance with the Contract requirements;
- Application for payment for Work Package which includes work element, including review and approval by Quality Assurance Manager; and
- Measures that will be implemented to ensure compliance with Buy America requirements on the Project.
- Detail two (2) sample entries in Materials Notebook showing completion of Form C-25, including subsequent submission and review by Department Project Manager as set forth in Section 5.21 of the January 2012 QA/QC Guide. Refer to Section 803.73 of VDOT's Manual of Instruction for Materials Division, Form TL-142S, for an example of a completed Materials Acceptance and Materials Notebook, refer to Chapter VII of the VODT Materials Division Manual of Instructions.

#### **2.14.1 Design Management**

The Design-Builder is responsible for design quality in accordance with VDOT's Minimum Requirements for Quality Assurance and Quality Control on Design-Build and Public-Private Transportation Act Projects, January 2012 (January 2012 QA/QC Guide). The Design-Builder's Design Manager shall be responsible for establishing and overseeing a QA/QC program for all pertinent disciplines involved in the design of the Project, including review of design, working plans, shop drawings, specifications, and constructability of the Project. This individual shall report directly to the Design-Builder's Project Manager, and is responsible for all of the design, inclusive of QA and QC activities. Members of the Design QA and QC team are responsible for review of all design elements to ensure the development of the plans and specifications are in accordance with the requirements of the Contract Documents. Design QA should be performed by one or more member(s) of the lead design team that are independent of the Design QC. The Project design control plan will provide VDOT assurance that the design plans and submittals will meet all contract requirements. The QAM shall verify that all design related Work Packages submitted for payment have been certified by the Design Manager as being in conformance with the Contract Documents and the Design QA/QC Plan.

Appendix 2 of the January 2012 QA/QC Guide provides minimum requirements that shall be met for development of the Design QA/QC Plan.

#### **2.14.2 Construction Management**

The Design-Builder shall develop, execute, and maintain a Construction QA/QC Plan for the full duration of the Contract in accordance with VDOT's January 2012 QA/QC Guide. The Design-Builder shall have the overall responsibility for both the QA and QC activities and shall be responsible for all QA activities and QA sampling and testing for all materials used and work performed on the Project. These QA functions shall be performed by an independent firm that has no

involvement in the construction and QC program/activities. There shall be a clear separation between QA and construction, including separation between QA inspection and testing operations and construction QC inspection and testing operations, including testing laboratories. Two (2) independent, AMRL certified testing laboratories will be required, one for QA testing and one for QC testing.

The Quality Assurance Manager (QAM) shall have the authority to enforce the Contract requirements when deficient materials or unsatisfactory finished products fail to conform to Contract requirements. The QAM, in accordance with his/her assignment, shall be responsible to observe the construction in progress and to ensure the QA and QC testing and inspection is being performed in accordance with the Contract requirements. The Design-Builder shall establish and maintain a Quality Assurance Auditing and Nonconformance Recovery Plan (AR Plan) for uniform reporting, controlling, correction and disposition and resolution of nonconformance (including disputed nonconforming items) issues that may arise on the Project. The Design-Builder's AR Plan shall establish a process for review and disposition of nonconforming workmanship, material, equipment or other construction and design elements of the Work including the submittal of the design review process for field changes. All deficiencies (hereinafter referred to as a Non-Conformance), including those pertaining to rules, regulations, and permit requirements, shall be documented by the QAM. A Non-Conformance Report (NCR) referenced by a unique number, shall be forwarded to the Contractor and VDOT within 24 hours of discovery of the Non-Conformance. Non-conformance procedures are provided in Section 5.10.5 of the January 2012 QA/QC Guide.

The Design-Builder also shall be responsible for providing QA and QC testing for all materials manufactured off-site, excluding the items listed below:

- Structural Steel Elements (beams, girders, and sign structures)
- Pipe (concrete, steel, aluminum, and high density polyethylene) for culverts, storm drains, and underdrains
- Precast Concrete Structures
- Asphalt Concrete Mixtures
- Aggregate (dense and open graded mixes)
- Metal Traffic Signal and Light Poles and Arms

VDOT will provide plant QA and plant QC inspection and/or testing of these items. In the event that VDOT determines that materials fail to meet the tolerances in the VDOT 2007 Road and Bridge specifications, a NCR will be issued by the VDOT Project Manager and addressed to the Design-Builder's QAM for resolution. The Design-Builder is required to submit documentation of the source of materials, including the source of each material to be incorporated into the Project and the acceptance method that will be used for the material. A VDOT Form C-25 may be used to meet this requirement; however, the Design-Builder is required to submit a VDOT Form C-25, for all materials that VDOT retains responsibility for testing. The source of materials, C-25 is for informational purposes only and will not be approved or rejected by VDOT since it is the Design-Builder's responsibility to obtain materials that meet the contractual requirements. The Design-Builder will be responsible for providing QA and QC testing of all off-site materials that are not identified above, including materials obtained from off-site soil borrow pits.

The Design-Builder's QAM shall report directly to the Design-Builder's Project Manager and be independent of the Design-Builder's physical construction operations. The QAM shall establish quantities prior to commencing construction, and provide VDOT a total number of QC, QA (Independent Assurance (IA) and Independent Verification Sampling and Testing (IVST)), Owner's (the Department) Independent Assurance (OIA), and Owner's Independent Verification Sampling and Testing (OVST) required as a result of the quantities and the sampling and testing requirements as set forth in Table A-3 and A-4 of the January 2012 QA/QC Guide. VDOT will provide all OIA and OVST tests and, therefore, final determination of the actual number of OIA and OVST tests to be performed will be made by VDOT based on these quantities.

The QAM shall be responsible for the QA inspection and testing of all materials used and work performed on the Project to include observing the Contractor's QC activities, maintaining the Materials Notebook (including adherence to the Special Provision for Design-Build Tracking (DBT) numbers included in the RFP Information Package), documentation of all materials, sources of materials and method of verification used to demonstrate compliance with the Contract requirements. This includes all materials where QA testing is to be performed by VDOT. The QAM shall be vested with the authority and responsibility to stop any work not being performed according to the Contract requirements. The construction QA and QC inspection personnel shall perform all of the construction inspection and sampling and testing work in accordance with the Contract requirements. This includes the documentation of construction activities and acceptance of manufactured materials. The Design-Builder's Quality Assurance firm shall have a presence on-site during any and all construction operations to ensure all construction work and QC activities are being performed in accordance with the Contract requirements. The QAM shall assign a Lead QA Inspector to the Project prior to the start of construction. This individual, who must be on the site full-time for the duration of all construction of the Project, shall be responsible to observe construction as it is being performed, to include all QC activities to ensure inspection and testing, and correction of any non-conformities of the Work are being performed in accordance with the Contract requirements. The Lead QA Inspector shall be supported by other QA inspectors under his/her direction to ensure at any time all construction operations and QC activities are being observed. The Lead QA Inspector shall report directly to the QAM.

All sampling and testing shall be performed by a laboratory that is accredited in the applicable AASHTO procedures by the AASHTO Accreditation Program (AAP). For test methods not accredited by AAP, the laboratory must comply with AASHTO R18 (most current Edition) and must be approved by the Department at its sole discretion. Two independent testing laboratories will be required, one for QA testing and one for QC testing. The entity(ies) performing QA operations, inspections, sampling, and laboratory testing and the entity(ies) performing QC operations, inspections, sampling, and laboratory testing shall be unique and independent from one another.

All construction QA and QC personnel shall hold current VDOT materials certifications for the types of materials testing that they are assigned to perform in accordance with Section 3.6 of the January 2012 QA/QC Guide, and for the safety and use of nuclear testing equipment as required by the Road and Bridge Specifications. The QA programs shall be performed under the direction of the QAM. The QC programs shall be performed under the direction of the Construction Manager. Substitution of Construction Manager and the QAM shall require VDOT approval. In addition, VDOT shall have the right to order the removal of any construction QA and QC personnel, including

the QAM and the Construction Manager for poor performance at the sole discretion of the VDOT Project Manager. The QA/QC plan shall include rapid reporting of non-compliance to the VDOT Project Manager, and shall include the remedial actions to be taken as discussed in Sections 5.10 and 5.11 of the January 2012 QA/QC Guide.

The Design-Builder shall provide, prior to Final Application for Payment, a complete set of Project records that include, but are not limited to the following:

- Project correspondence
- Project diaries
- Test reports
- Invoices
- Materials books
- Certified survey records
- DBE/EEO records
- Warranties
- As-Built drawings
- Special tools

## **2.15 Field Office**

The Design-Builder shall provide office space, equipment, and services consistent with the requirements for a Modified Field Office Type I. This field office shall be for the exclusive use by Department staff. The configuration and equipping of the field office shall be coordinated between the Design-Builder and the VDOT Project Manager prior to on-site placement of the field office. The field office will be operational throughout the duration of the Project construction and shall be removed upon final Project acceptance.

## **2.16 Plan Preparation**

### **2.16.1 GEOPAK and MicroStation**

When the Design-Builder is given the Date of Commencement, they will be furnished with the following software and files which run in WindowsXP or Windows7 only: GEOPAK (current version used by VDOT), MicroStation (current version used by VDOT) and VDOT Standard Resources Files, and all the design files used to develop the RFP Conceptual Roadway and Bridge Plans including aerial images, if available, and survey files.

### **2.16.2 Software License Requirements**

VDOT shall furnish a License Access Key for all the software products VDOT makes available to the Design-Builder. The License Access Key will be supplied upon request by the Design-Builder, based on the data provided on a completed Software License Form, LD-893, and subsequently reviewed and approved by the VDOT Project Manager.

The License Access Keys are provided for use on the Project detailed on the request only for the duration specified for that Project. Any adjustment made to the Project schedule will be taken into consideration in adjusting the time the License Access Key is available. Justification for the number of license(s) requested **MUST** include the estimated number of total computer hours for the task of design, detailing, relating Project management and other computer based engineering functions requiring the software requested.

The appropriate use of the License Access Key provided to the Design-Builder will become the responsibility of the Design-Builder regardless of who on the team uses the License Access Key. The Design-Builder will be responsible for keeping track of the License Access Key provided to them or a team member and, upon completion of the Project, the prompt notification to the VDOT CADD Support Section of Project Completion and removal of the software from any system used solely for the Project for which it was obtained.

### **2.16.3 Drafting Standards**

All plans shall be prepared in U.S. customary units and in accordance with the most recent version of the VDOT's Road Design Manual, Vol. I, VDOT's CADD Manual and VDOT's I&IMs and VDOT's Manual of Structure and Bridge Division, Vol. V, Part 2, Design Aids and Typical Details.

### **2.16.4 Electronic Files**

The Design-Builder shall submit all plans in accordance with the Department's policies and procedures (Right of Way and/or Construction submittals, Released for Construction, and As-Builts) in electronic format using the provided CADD software. Files shall be submitted in both Microstation DGN and Adobe PDF formats, by way of VDOT's Falcon Consultant environment or FTP Server. The Design-Builder will complete form LD-443, the Falcon System Access and Security Agreement and form LD-894, the Falcon Access Request Form, for access to the Falcon Consultant environment. VDOT will furnish electronic files of all applicable standard detail sheets upon request by Design-Builder. The files will use standard VDOT cell libraries, level structures, line types, text fonts, and naming conventions as described in the most recent version of the VDOT CADD Manual and VDOT's Manual of the Structure and Bridge Division, Vol. V - Part 2, Design Aids and Typical Details. Files furnished to Design-Builder in electronic format shall be returned to VDOT and removed from Design-Builder and its designer's computer equipment upon completion of this Project.

### **2.16.5 Plan Submittals**

In addition to electronic files as described in Part 2, Section 2.16.4 above, the Design-Builder shall prepare and distribute hard copy paper plans in the quantities as specified below, for each of the following deliverables (at a minimum, as other submittals and/or work packages may be necessary or desired):

- Right of Way Plans (if applicable)
- Released for Construction Plans

- Right of Way and/or Construction Revisions
- Record Plans (As-Built)
- Approved Shop Drawings
- Design Calculations

The Right of Way and/or Construction plans may be submitted for approval in logical subsections (such as from bridge to bridge) or consisting of work packages such as: 1) clearing and grubbing along with erosion and siltation control, 2) grading and drainage, 3) final roadway, and 4) traffic control. Individual bridge plans may be submitted in logical components such as: 1) foundation, 2) remaining substructure, and 3) superstructure. A submittal schedule and planned breakdown of work packages shall be submitted to VDOT for review and approval as part of the planned Project Baseline schedule.

Right of Way and/or Construction Plans shall be accompanied by 1) a VDOT LD-436 checklist filled out as appropriate for the specific submittal, and 2) a written notice signed by the Design-Build Design Manager that includes the following:

- The logical subsections or work packages for which review and approval is being requested
- Confirmation that the submittal has been checked and reviewed in accordance with the Design-Builder's approved QA/QC plan.
- Confirmation that the submittal either meets all requirements of the Contract Documents and Reference Documents or that any deviations from the Contract Documents and Reference Documents have been identified and previously approved by VDOT.

The Design-Builder shall submit all Right of Way and/or Construction plans to VDOT, Transurban, and FHWA simultaneously, for review and approval. VDOT shall receive two (2) full-size sets and ten (10) half-size sets of each submission, with the exception of the Released for Construction Plans (see Part 2, Section 2.16.8 below). Transurban shall receive three (3) half-size sets of each submission. FHWA shall receive one (1) half-size set of each submission. The plan submissions shall be delivered to the following addresses:

Virginia Department of Transportation  
Attention – Paul Nishimoto  
4975 Alliance Drive  
Fairfax, VA 22030

Transurban  
Attention – Kevin Ginnerty  
6440 General Green Way  
Alexandria, VA 22312

Federal Highway Administration  
Attention – Elliott Moore  
400 N. 8<sup>th</sup> Street, Suite 750

Richmond, VA 23219-4825

VDOT and FHWA shall have the right to review all Right of Way and Construction Plans and provide comments regarding compliance with the requirements of the Contract Documents and Reference Documents. The Design-Builder shall be responsible for satisfying all such comments. Formal responses to VDOT and FHWA comments shall be provided in subsequent submittals.

VDOT and FHWA have the right to disapprove any design approach that is not in compliance with the requirements of the Contract Documents and Referenced Documents.

VDOT's written approval of any deviations from requirements of the Contract Documents and Reference Documents shall be attached to the plans submitted for review.

### **2.16.6 Right of Way Plans**

Right of Way Plans and any associated Design Calculations shall be submitted to VDOT and FHWA simultaneously for review. The time frame for plan review and approval shall be in accordance with the requirements of the Contract Documents. All VDOT and FHWA comments must be adequately addressed before the Right of Way Plans will be approved. Notice to Commence Right of Way Acquisition will be granted in accordance with Part 2, Section 2.12 above. The Design-Builder shall be responsible for the design details and ensuring that the design and right of way acquisition work are properly coordinated.

### **2.16.7 Construction Plans**

Construction Plans, and any associated Design Calculations, shall be submitted to VDOT and FHWA simultaneously for review. The time frame for plan review and approval shall be in accordance the requirements of the Contract Documents. All VDOT and FHWA comments must be addressed to the satisfaction of the commentator before Construction Plans are recommended for approval to the Chief Engineer. This plan milestone includes plans that may be submitted as soon as sufficient information is available to develop Construction Plans for certain portions or elements of the Project (or work packages). The Design-Builder shall meet commitments for review and approval by other entities/agencies as specified in other portions of the RFP and its attachments. The Design-Builder shall be responsible for the design details and ensuring that the design and construction work are properly coordinated.

### **2.16.8 Released for Construction Plans**

*Released for Construction Plans* are those that are issued for construction after approval by VDOT's Chief Engineer. Notice to Commence Construction will only be issued by the VDOT Project Manager upon approval of the Construction Plans (or Work Packages) by the Chief Engineer.

The Released for Construction Plans shall be distributed simultaneously to VDOT, Transurban, and and FHWA. VDOT shall receive one (1) full-size set and five (5) half-size sets of Released for Construction Plans, along with all electronic files. Transurban shall receive three (3) half-size hard copy sets, along with all electronic files. FHWA shall receive one (1) half-size hard

copy set, along with all electronic files, of the Released for Construction Plans. The plans shall be delivered to the following addresses:

Virginia Department of Transportation  
Attention – Paul Nishimoto  
4975 Alliance Drive  
Fairfax, VA 22030

Transurban  
Attention – Kevin Ginnerty  
6440 General Green Way  
Alexandria, VA 22312

Federal Highway Administration  
Attention – Elliott Moore  
400 N. 8<sup>th</sup> Street, Suite 750  
Richmond, VA 23219-4825

### **2.16.9 Record (As-Built) Plans**

As a condition to Project Completion, the Design-Builder shall provide to the Department, Record (As-Built) Plans of the Project in accordance with the standards and specifications set forth in this Technical Requirements, which shall consist of two hard-copy sets, one electronic file of each plan in .pdf format, and one electronic file in MicroStation .dgn format of the final construction plans. The final plan milestone is Record (As-Built) Plans. The As-Built Plans shall be prepared, signed, and sealed by a Professional Engineer licensed in Virginia, and submitted to VDOT with the final application for payment. These plans shall show all adjustments and revisions to the Construction Plans made during construction and serve as a permanent record of the actual location of all constructed elements.

The As-built plans shall have Global Positioning System (GPS) location data of all installed TTMS field devices, including but not limited to; junction boxes (electrical and communication), splice cabinets, CCTV and AID cameras, Dynamic Message Sign (DMS), Microwave Vehicle Detectors, gates, pole and ground mounted cabinets, roadway lighting and electrical service panel. A detailed list or spreadsheet of all installed or modified TTMS field devices, including at a minimum the device location, model number, serial number, and test acceptance date, shall be part of the As-Built documents.

The As-built plans shall show fiber optic splicing diagrams detailing all cable splices, terminations, equipment port assignments, and optical circuits within the communication network. Document the sequential cable length markings at each splice box and pull box wall that the cable passes through, and include the information with the as-built documentation.

The As-Built plans shall show field verified cabinet numbers, service panel numbers, and roadway lighting pole electrical identification numbers.

## **2.17 Virginia Occupational Safety and Health Standards**

The Project shall comply with Virginia Occupational Safety and Health Standards in accordance with Section 107.17 of the Division I Amendments to the Standard Specifications.

- At a minimum, all Design-Builder personnel shall comply with the following, unless otherwise determined unsafe or inappropriate in accordance with OSHA regulations:
- Hard hats shall be worn while participating in or observing all types of field work when outside of a building or outside of the cab of a vehicle, and exposed to, participating in or supervising construction.
- Respiratory protective equipment shall be worn whenever an individual is exposed to any item listed in the OSHA Standards as needing such protection unless it is shown the employee is protected by engineering controls.
- Adequate eye protection shall be worn in the proximity of grinding, breaking of rock and/or concrete, while using brush chippers, striking metal against metal or when working in situations where the eyesight may be in jeopardy.
- Approved high visibility Safety apparel shall be worn by all exposed to vehicular traffic and construction equipment.
- Standards and guidelines of the current Virginia Work Area Protection Manual shall be used when setting, reviewing, maintaining, and removing traffic controls.
- Flaggers shall be certified in accordance with the Virginia Flagger Certification Program.
- No person shall be permitted to position themselves under any raised load or between hinge points of equipment without first taking steps to support the load by the placing of a safety bar or blocking.
- Explosives shall be purchased, transported, stored, used and disposed of by a Virginia State Certified Blaster in possession of a current criminal history record check and a commercial driver's license with hazardous materials endorsement and a valid medical examiner's certificate. All Federal, State and local regulations pertaining to explosives shall be strictly followed.
- All electrical tools shall be adequately grounded or double insulated. Ground Fault Circuit Interrupter (GFCI) protection must be installed in accordance with the National Electrical Code (NEC) and current Virginia Occupational Safety and Health agency (VOSH). If extension cords are used, they shall be free of defects and designed for their environment and intended use.
- No person shall enter a confined space without training, permits and authorization.
- Fall protection is required whenever an employee is exposed to a fall six (6) feet or greater.

## **2.18 Testing**

The Design-Builder shall submit to the Department a testing plan for the 95 Express Lanes extension Work that shall include as a minimum:

- The scope, requirements and objectives of the testing plan;
- An overall high-level plan for testing the ETC and TMS, including the test stages and processes, and the scheduling of all tests 180 days prior to Service Commencement; and
- The roles and responsibilities of all those involved with the testing program and any dependencies on third parties, including Department personnel.

Testing and commissioning, where applicable, shall be based on the application of a systems engineering methodology such as ANSI/GEIA EIA- 632. Testing and commissioning shall be the primary responsibility of the Design-Builder with input and support from Transurban and shall utilize:

- A Verification Cross Reference Index (VCRI), which shall be developed and documented to establish the way in which requirements are satisfied. The VCRI shall utilize test, demonstrate, inspect and analyze as methods for acceptance;
- A test series that shall demonstrate compliance with the performance requirements through a test plan and procedures;
- A testing strategy document that details how the testing plan will be implemented to demonstrate conformance of the proposed solution to the various functional, technical, and performance requirements; and
- A test plan document that describes how the testing strategy will be executed to demonstrate the various functional, technical, and performance requirements for compliance to requirements, which shall include:
  - Test specifications for each of the test cycles
  - Detailed requirements traceability matrix linking each of the test series to relevant requirement(s)
  - Detailed test script(s) for each of the test series, including input/process/output at each of the steps so that conformance can be monitored.

The testing strategy for the 95 Express Lanes Southern Terminus Extension shall provide the level of detail to ensure compliance with the overall testing requirements. This testing strategy shall include:

- System design and integration overview. Transurban will provide this documentation.
- User Acceptance Testing – to ensure that individual functions operate as defined in the requirements specification or similar documents and the complete end-to-end process is tested. User Acceptance Test will be completed at least thirty (30) days before Service Commencement of the ETTM. The Department will approve successful completion of the UAT for Service Commencement. Transurban will provide this documentation.

- Factory Acceptance Testing – tests to be conducted at the supplier’s premises to verify that the equipment, subsystem or system complies with the functional and performance requirements of that supplier’s subcontract
- Site Acceptance Testing – tests to be conducted at the point of installation (tolling point and Traffic Operations Center) to confirm the factory acceptance testing results, plus any omissions or errors noted during the factory testing
- Integration Acceptance Testing – a test conducted to ensure that the complete ETC and TMS meets the end-to-end system-level functional and performance requirements for normal and exception operating conditions. Transurban will provide this documentation.

## **2.19 Service Commencement**

The Design-Builder shall provide a Service Commencement Plan that defines and documents all activities, organization, and coordination efforts to activate and turnover the new ramps, and commission the ETTM system into operational service. The Service Commencement Plan will provide the schedule and phasing for activating roadway segments, operational service activities, and ETTM systems start-up, as applicable. The Service Commencement Plan shall be provided 180 days prior to the anticipated Service Commencement Date. Service Commencement activities shall be included in the project baseline schedule.

The Design-Builder shall notify the Department of the completion of all commissioning activities at least one hundred twenty (120) days prior to the anticipated date of Service Commencement. The Design-Builder shall provide to the Department commissioning completion approvals and agreements that demonstrate the readiness of the Design-Builder and O&M Contractor to proceed with Service Commencement. The Service Commencement compliance checklist, as required by the Service Commencement Plan, shall be submitted by the Design-Builder with all notices as demonstration the necessary requirements to achieve Service Commencement are complete.

The Service Commencement Plan shall include, but is not limited to, the following elements:

- A detailed narrative explaining how the Design-Builder will conduct the entire process of testing and commissioning the new ramps and components;
- A detailed schedule that demonstrates the Design-Builder will commence the testing and commissioning process with sufficient advance such that the entire new ramps and components can achieve Service Commencement as expected;
- A description of discrete activities that explains how the testing and commissioning process will proceed including all tests that must be performed, and in concert with cooperation from the Department on how the Department has points of involvement in the process;
- A description of forms and procedures to be followed such that the process follows a systematic methodology including all formal notices;

- A listing of all points of interaction of stepped approvals needed by the Quality Management System Plan (QMSP) including all Hold and Witness Points, inspections, tests, and other QMSP functions;
- A description of required Maintenance of Traffic planning needed to achieve Service Commencement including all lane closures needed to facilitate testing and commissioning;
- An organizational structure that demonstrates the key Design-Builder staff directly engaged in the Service Commencement process including the direct lead for the Service Commencement process for the Design-Builder;
- A detailed schedule for implementing the Sign Sequencing and Sign Unveiling Plans as defined in Part 2, Section 2.9.1.2;
- A compliance checklist that demonstrates all requirements of the Agreement are achieved in order to satisfy the requirements for the Service Commencement Notice to Proceed.

### **2.19.1 Service Commencement Notice to Proceed**

At least ninety (90) days prior to the date when the Design-Builder anticipates to achieve Service Commencement, the Design-Builder shall deliver to the Department a notice that it is ready for Service Commencement. The notice of readiness for Service Commencement shall contain a report and description of results of all Work completed with respect to the Express Lanes in a form acceptable to the Department; and with sufficient detail to support whether readiness for Service Commencement has been achieved. The notice shall include the compliance checklist as described above. Within ten (10) days after receipt of the notice of readiness for Service Commencement from the Design-Builder, the Design-Builder and the Department shall inspect the Express Lanes and all related Work completed, including the review of the report submitted by the Design-Builder, for approval and acceptance.

If readiness for Service Commencement has not been achieved, the Department shall notify the Design-Builder of the actions or additional Work necessary to achieve readiness for Service Commencement. This process shall be repeated until the Department is satisfied with the notice of readiness for Service Commencement and agrees that readiness for Service Commencement has been achieved. Within twenty (20) days after the Design-Builder has provided the notice of Service Commencement to the Department, the Design-Builder and the Department will meet regularly to expedite the steps necessary to achieve Service Commencement. The Department will issue the Service Commencement Notice to Proceed only if completion is achieved in accordance with the approved Service Commencement Plan.

### **2.19.2 Performance Tests**

The Design-Builder shall provide all successfully completed Performance Test's reports to the Department for review and approval. The Performance Test's shall be conducted in accordance with Part 2, Section 2.18 of the Technical Requirements. Test Reports shall include: Factory Acceptance Test, Level A Testing, and Level B Testing. At least sixty (60) days prior to the date the Design-Builder wishes to commence a Performance Test, the Design-Builder shall provide to the Department

for approval complete test procedures developed in accordance with Part 2, Section 2.18 of the Technical Requirements.

The Design-Builder shall designate and make available qualified and authorized representatives to conduct and observe the Performance Tests, and to monitor the taking of measurements to determine the level of achievement of the Performance Guarantees, all in accordance with the Agreement and the Performance Testing and Commissioning Plan and Program. The Department will witness and be included in such Performance Tests conducted for purposes of demonstrating effective information transfer across system interfaces. The Design-Builder shall not attempt to perform a Performance Test if any Commissioning, start-up or initial test procedures have not been completed as required prior to the Performance Test or any aspect of the Project has not been completed sufficiently to assure the safe and continuous operation of all or any part of the Project during the Performance Test in accordance with the Standard of Care, the Operating Manual, the Agreement and the Performance Testing and Commissioning Plan and Program.

## **2.20 Maintenance during Construction**

The Design-Builder shall maintain all existing Department's ATMS devices in the 95 General Purpose Lanes and 95 Express Lanes operational during construction unless otherwise approved by the Department. These existing Department's ATMS devices include, but are not limited to: closed-circuit television (CCTV) cameras; dynamic message signs (DMS); detection; weather stations; and associated cabinets and infrastructure.

Existing Department ATMS in the Project limits shall remain continuously operational or temporarily replaced during construction unless written approval is provided by the Department. Replacement systems shall be installed, operational and integrated before removal of existing devices. The Design-Builder shall be responsible for relocating and replacing existing ATMS devices.

Once the Existing ATMS devices are impacted, the Design-Builder shall be responsible for maintaining those devices until their final acceptance.

The Design-Builder shall be responsible for any impact to the existing ITS infrastructure within the construction limits. Prompt response is required to any damage caused by the Design-Builder and in the event the repair isn't completed 2 hours prior to the next traffic peak, the Department will use its maintenance Contractor to restore critical systems and charge the Design-Builder accordingly. The cost of repair work performed, plus 25% for supervisory and administrative personnel, will be deducted from monies due to the Design-Builder for the Project.

The Design-Builder shall maintain existing ATMS devices or temporarily replace with portable unit to provide similar functionality and coverage for the duration of construction as approved by the Department.

- Portable CCTV shall provide uninterrupted view of the roadway with overlapping coverage.

- Portable DMS placement and spacing shall provide adequate coverage to convey messages to motorist.
- Both portable CCTV and DMS shall be integrated into the Department operation center for similar functionality and coverage.

The existing drainage system will be maintained by the Department until the Design-Builder starts impacting the drainage system, at which time all drainage assets within the impacted drainage system will become the Design-Builder's responsibility.

The Department shall continue to maintain all existing Department lighting within the Project until the Design-Builder begins impacting these assets, at which time impacted lighting shall become the Design-Builder's responsibility. At no time shall the lights within the Project be put out of service, unless otherwise approved by the Department.

The Department will perform snow and ice removal on all travel ways, during construction. No lane closures will be permitted, during snow mobilization of Level 2 or above.

The Design-Builder shall be responsible for maintaining the proposed SWM BMP's once all connections have been completed, and shall certify that the SWM BMP's have been maintained as per the Department, DEQ, and manufacturer's (for proprietary products) maintenance guidelines prior to transfer to the Department.

The Design-Builder shall be responsible for performing construction maintenance during detours, suspension of work situations, flagging operations, grading operations, patching operations, and on all haul routes.

## **2.21 Notification of Impact (NOI) to VDOT Assets**

As part of the overall construction of the Project, a process for controlling the work that will impact Department traffic management system assets is required. A significant portion of this work will depend on field conditions and the state of the system, neither of which can be determined during the design phase. The impact of construction on the Department Assets shall be coordinated by the Design-Builder by the Notification of Impact (NOI) to the Department.

### **2.21.1 General Requirements**

This NOI process shall apply to all Department traffic management system components (referred to herein as "the assets") within project limits that are impacted by the Design-Builder's construction activities.

The work shall be governed by the general requirement that the impacted Department assets shall be maintained or returned to a condition equal or better than the condition at the start of construction unless otherwise indicated in the plans or approved by the Department. This shall include both the functionality and maintainability of the assets.

While this NOI process is intended to provide specific controls on work impacting Department assets, a number of factors both within and beyond the control of the Design-Builder may impact the work. Specific elements of the proposed work plan such as schedule or means and methods of completing the work may require revisions that are not consistent with these provisions in order to safely and effectively complete the work. As such, these provisions should be treated as a typical application and general framework for control of the work. When deviations are required due to changing field conditions, no reasonable request by the Design-Builder or the Department for changes may be denied without good cause.

Plans related to existing Department assets have been prepared using a combination of original design drawings, as-built drawings, supplemental information provided by the Department, and site visits. This NOI process recognizes that complete documentation of the existing Department system is unavailable, the ability to field verify conditions as part of design is limited, and that conditions can change between the time of design and the time of construction. As part of the design development process, it has been agreed that certain information and decisions will be made during construction at such time the elements of the system can be verified as to precise location and operational status. The Department, the Design-Builder, and the Engineer shall work together to identify and coordinate those items that could not be addressed during design.

The Department and the Design-Builder shall regularly work together to coordinate work that may impact Department assets. This coordination shall include, but not be limited to Department staff and representatives attending regularly scheduled construction coordination meetings held by the Design-Builder.

"Impact" is defined as any work that will interrupt the normal operation of the Department's assets.

No work that impacts Department assets identified in the plans shall commence without prior notification to the Department per the provisions of this NOI process.

The Design-Builder shall take all measures to protect Department assets during the course of the work and maintain operation of the equipment. The means and methods for protecting Department assets shall be determined on a case-by-case basis appropriate to the scope of the work.

The Department shall make staff available upon request to assist the Design-Builder in identifying existing system conflicts and operations; conducting asset inspections; carrying out maintenance transfers; and testing and acceptance of completed work. The availability of Department staff shall be coordinated per the requirements of this NOI process. When unexpected conditions arise that requires the input of the Department, the Department shall make staff or authorized representatives available within forty-eight (48) hours of Department receipt of the Design-Builder's written request.

The provisions of this NOI process shall apply to all work impacting Department assets shown on the plans as well as to any asset impacted during the course of construction, but not identified on the plans. When assets not identified on the plans are impacted, the Design-Builder shall follow the typical construction processes (RFI, FDC, etc.) to identify and resolve the impact within the bounds of this NOI process.

The Department shall notify the Design-Builder of any impacts to operations that may be attributable to work at other sites that were not anticipated in the original Notification. The Design-Builder and the Department shall coordinate as necessary for unanticipated impacts to operations.

Unless specifically described on the plans or special provisions or directed by the Department in writing, means and methods for completing the work related to impacted assets shall be at the discretion of the Design-Builder. Means and methods shall be consistent with the requirements of all contract documents, the Standards and Specifications, and Good Industry Practice.

With the exception of the Notification Form, written correspondence described in this NOI process may include e-mail to those parties listed as contacts in this NOI process or the Notification Form. Written correspondence shall reference the relevant Notification ID number and phase of the process.

Responsibility for maintenance of impacted assets shall transfer to the Design-Builder per the approved schedule for start of the work unless otherwise noted on the Notification Form. Responsibility for maintenance will transfer back to the Department upon final acceptance of the work as detailed in the Notification process. During the period when maintenance of Department assets has been transferred to the Design-Builder, events outside the control of the Design-Builder that impact the condition of the assets shall be addressed by the Department including the warranty claims and at-fault third parties. The Department shall be notified immediately of any damage to existing assets.

The Design-Builder shall be required to submit an Amended NOI if work described in initial notification is performed at least 48 hours after date stated in the NOI form.

The Design-Builder shall document all changes to VDOT infrastructure as a result of work in the NOI in the project As-Built plans according to the As-Built plans Technical Requirements. The As-Built plan will be required for all impacted VDOT assets even if such asset is not shown on project design plans.

**2.21.2 Notification Procedure**

Schedule		
	Milestone	
	Description	
21 Days Prior to Work Start	First Notification	<p>The Design-Builder shall submit a complete <b><u>Notification of Impact to VDOT TMS Asset</u></b> form to the VDOT Engineer. The form shall be provided a minimum of 21 calendar days prior to the proposed start of the work impacting the asset.</p>
18 Days Prior to Work Start	Notification Review	<p>The VDOT Engineer shall review the form for conformance with the plans and contract documents. Within 3 days of receipt, the VDOT Engineer shall respond to the submitted form. The VDOT Engineer shall provide one of three responses:</p> <p><i>Approved</i> – The form is found to be in conformance with all documented requirements and is approved as submitted. The process moves to the Inspection phase.</p> <p><i>Revise and Resubmit</i> – The form is conditionally approved with minor corrections or clarifications required as noted in the VDOT Engineer’s response. The process moves to the Inspection phase and the Design-Builder revises the Form as needed for resubmittal prior to the second notification</p> <p><i>Rejected</i> – The form has significant elements that are not in conformance with the plans or other contract documents. The VDOT Engineer notes the specific elements of the form not in conformance and cites the controlling contract requirements not met. The Design-Builder shall submit the form again beginning at the first notification.</p>

Schedule	
	Milestone
	Description
14 Days Prior to Work Start	<p><b>Inspection</b></p> <p>Following approval or conditional approval of the Notification Form, the VDOT Engineer and the Design-Builder shall conduct a joint field meeting at the asset to be impacted. VDOT shall provide the Design-Builder access to the equipment and assets to be impacted for general inspection and demonstrate the operational status of the equipment. If the proposed impact is not limited to a single site (e.g., impact to power or communications connecting multiple devices), VDOT shall also demonstrate operation at a remote location to establish the existing condition of all elements to be impacted by the work. The Design-Builder shall document the condition of the site through field notes and photos as needed. The Design-Builder shall provide written notification to the VDOT Engineer of any site deficiencies within 24 hours of the inspection. VDOT shall assess deficiencies and provide a response to the Design-Builder within 48 hours of receipt of the Design-Builder’s report. The response shall include one of the following:</p> <p><i>VDOT Repair/Replace</i> – VDOT shall repair or replace deficient equipment prior to the start of the work. A second inspection shall be scheduled to document the existing condition of the assets prior to the start of the work.</p> <p><i>Proceed per Plan</i>– VDOT shall instruct the Design-Builder to carry out the work as shown in the plans and proposed on the notification form accepting the condition of the assets as is. The Design-Builder shall complete the work as required by the Contract documents and return the system to its existing condition at the time of the inspection accounting for the deficiencies of the system noted in their report. For example, VDOT may instruct the Design-Builder to relocate a camera as called for in the plans even if the camera is inoperative at the time of inspection. The Design-Builder will relocate the camera noting that it was inoperative prior to start and maintaining its current condition.</p> <p><i>Request for Change</i> – VDOT shall request a change to the plans to address the deficient conditions. This may include requesting the Design-Builder to carry out repair or replacement or removal and disposal/salvage of the impacted assets. This process shall follow the typical process for changes to the contract accounting for any impacts to schedule and scope.</p>

<b>Schedule</b>	
<b>Milestone</b>	
	<b>Description</b>
<b>10 Days Prior to Work Start</b>	<p><b>Second Notification</b></p> <p>The Design-Builder shall provide a second notification to the Department for the start of the work. If the notification form was required to be revised and resubmitted as part of a conditional approval, the Design-Builder shall provide the revised form with this notification. The Design-Builder may propose changes to the original request as part of the second notification. This may include minor changes to the schedule of the work or revisions to the construction work plan. If no updates to the first notification are required, the Design-Builder shall provide only a written reaffirmation of the original notification.</p> <p>The VDOT Engineer shall approve or reject the updated form within 48 hours of its receipt and provide a written response per the requirements of the first notification.</p>
<b>24 Hours Prior to Work Start</b>	<p><b>Confirming Notification</b></p> <p>The Design-Builder shall provide written confirmation of the planned work a minimum of 24 hours prior to the scheduled start of the work. Minor deviations of the written notification form shall be allowed (e.g., minor changes in the specific start time; updated contact information, etc.)</p>
<b>15 Minutes Prior to Work Start</b>	<p><b>Final Notification</b></p> <p>The Design-Builder shall provide final notification 15 minutes prior to the start of the work if required by the Department as noted on the approved notification form. This notification shall be made for assets identified by the Department as being of significant operational value. An asset of “significant operational value” is one which must remain in operation until an unscheduled incident or condition is resolved. The Department shall identify these assets on the notification form. The Design-Builder shall provide this final notification to the PSTOC or other Department staff as identified by the VDOT Engineer in the Notification Process.</p>

<b>Schedule</b>		
	<b>Milestone</b>	
		<b>Description</b>
<b>Start of Work</b>	<b>Work</b>	<p>The Design-Builder shall carry out the work in accordance with the Contract documents and approved notification form. The Design-Builder should provide daily updates to the VDOT Engineer on the progress of the work or as required on the notification form. The Design-Builder shall notify the VDOT Engineer of any events or issues that arise during the course of the work that may impact the scheduled completion of the work. The Design-Builder shall provide a plan for recovery of schedule as needed.</p>
<b>Completion of Work</b>	<b>Notification of Completion</b>	<p>The Design-Builder shall notify the VDOT Engineer immediately upon completing the work. The VDOT Engineer shall verify the operation of the asset as needed to ensure the basic scope of the work is completed. The VDOT Engineer shall notify the Design-Builder immediately of any impact to normal operation of the asset following completion of the work.</p>
<b>48 Hours After Completion of Work</b>	<b>Return of Maintenance</b>	<p>The Design-Builder and the Department shall conduct a return of maintenance inspection within 48 hours of completion of the work. The Department shall inspect the work on site and provide a written punch list or acceptance as appropriate. Maintenance of the asset shall transfer back to the Department upon completion of any punch list items and issuance of the written acceptance. Written acceptance shall be provided no less than 48 hours following the final inspection.</p>

### **3.0 ATTACHMENTS**

The following attachments are specifically made a part of, and incorporated by reference into, these Technical Information & Requirements:

ATTACHMENT 2.2 -- ROADWAY INVENTORY AND MAJOR DESIGN  
CRITERIA

All additional information is included in the RFP Information Package – referred to in Part 1, Section 2.8.4 of this RFP.

**END OF PART 2 - TECHNICAL INFORMATION & REQUIREMENTS**

*EXECUTION VERSION*

**I-95 HOV/HOT Lanes Project  
Southern Terminus Extension**

**Exhibit C-2**

**Technical Requirements**

**Attachment 1.5c**

**Approved Design Exceptions, Design Waivers  
and Other Approvals Prior to Commercial  
Close**

*EXECUTION VERSION*

**Attachment 1.5c**

List of Design Exceptions/Waivers

The attached list of Design Exceptions (DEs) and Design Waivers (DWs) is subject to change throughout the design development process. Additional Design Exceptions and Design Waivers that are identified and approved throughout the design development process will be added and/or deleted from the attached list by addendum.

It is further noted that if any element of an approved Design Exception or Design Waiver is changed during construction or design, the Concessionaire is required to re-submit the DE/DW package for reevaluation and approval by the Department and FHWA, if necessary.

<b>Number</b>	<b>Name</b>	<b>Description</b>	<b>Date Approved (VDOT) **</b>
DW16	Alternative Shoulder Pavement Design and Revised MC-4 Requirements Along 95 Express Lanes (Southern Terminus Extension)	Express Lanes Shoulder Pavement	1-March-16
DW17	Reduced Ramp Lane Width, Paved Left Shoulder Width, and Revised GS-11 Requirements Along 95 Express Lanes (Southern Terminus Extension)	Ramp Lane and shoulder widths and revised GS-11	1-March-16
DW18	Substandard Shoulder Width and Revised MC-4 Requirements Along I-95 GP Lanes (Southern Terminus Extension)	Reduced GP Lanes shoulder width	1-March-16

\*\* In the case of the Design Waivers (DWs), "Date Approved" refers to the date in which the DW was approved by VDOT. Federal Highway Administration (FHWA) approval of Design Waivers is not required.