

Purpose

The purpose of this Exhibit is to identify the scope and technical requirements (“Technical Requirements”) to develop and operate the Project. The Work required by the Technical Requirements shall be undertaken by or on behalf of the Developer.

Table of Contents

1	Project Management.....	4
1.1	Overview	4
1.2	Project Administration.....	4
1.3	Project Development Plans	15
1.4	Schedules.....	16
1.5	Standards and Specifications	29
1.6	Right-of-Way	30
1.7	Utilities	36
1.8	Work Restrictions	42
1.9	Maintenance of Traffic.....	56
1.10	Third Parties and Permitting.....	61
1.11	Emergency Services	64
1.12	Safety	65
1.13	Quality Assurance and Quality Control	66
2	Communications	72
2.1	General Requirements.....	72
2.2	Public Outreach	73
2.3	Media Relations and Outreach.....	74
2.4	Express Lanes Communications.....	75
3	Design and Construction Requirements.....	77
3.1	General Requirements.....	77
3.2	Environmental.....	80
3.3	Geotechnical	97
3.4	Materials	103
3.5	Drainage.....	105

3.6	Roadway Design	115
3.7	Pavement	117
3.8	Traffic Engineering	120
3.9	Barriers, Guardrails, and Fences	129
3.10	Aesthetics	130
3.11	Landscaping	132
3.12	Capital Asset Facilities	133
3.13	Sidewalks and Shared Use Paths	134
3.14	Structures	137
3.15	Electronic Toll and Traffic Management System	158
3.16	Maintenance During Construction	196
3.17	As-Built Documents	199
3.18	Survey	203
3.19	Security	206
3.20	Railroad Design	207
3.21	Transit Facility Design	207
3.22	Park-and-Ride Facilities	212
3.23	Transit Services and Travel Demand Management (TDM) Strategies	217
4	Operations, Maintenance, and Tolling For the Express Lanes	219
4.1	General Requirements	219
4.2	Inspection Requirements	219
4.3	Maintenance Requirements	221
4.4	Operations Requirements	224
4.5	Performance Requirements	233
4.6	Maintenance and Handback Requirements	234
4.7	Tolling Requirements	236
4.8	Reporting During Operations Period	243

Attachments

- Attachment 1.1: Acronym Table and Definitions
- Attachment 1.3: Project Development Plans
- Attachment 1.5: Standards and Specifications

Attachment 1.8:	Lane Closure Guidelines for Northern Virginia and Lane Closure Policy
Attachment 1.11:	Construction Emergency Operations Communications Plan
Attachment 3.1a:	Long-Range Transportation Planning Improvement Projects
Attachment 3.1b:	Summary of Design Exceptions and Waivers
Attachment 3.3:	Settlement of Structures
Attachment 3.5:	Nutrient Credit Assignment Agreement
Attachment 3.6:	Roadway Design Criteria
Attachment 3.7:	Minimum Pavement Sections
Attachment 3.11:	Manassas National Battlefield Park Proposed Reforestation Area
Attachment 3.14a:	Bridge Replacements Table
Attachment 3.14b:	Proposed Facilities at Proposed Express Lanes Access Ramp Structure at Vaden Drive
Attachment 3.14c:	Existing Bridges and Culverts Information Table
Attachment 3.14d:	Bridge Widening and Repairs Table
Attachment 3.14e:	Bridge Repair Quantities Table
Attachment 3.14f:	New Bridges – Additional Requirements
Attachment 3.14g:	Criteria for Placement of Bridge Piers and Walls within Limits of Space Reserved for Future Metrorail
Attachment 3.19:	Security Requirements for Developer Operated Critical Infrastructure Facilities and Structures
Attachment 4.3:	Bridge Maintenance Responsibilities
Attachment 4.5:	Performance Requirements Baseline Tables
Attachment 4.6:	Maintenance Responsibility Matrix
Attachment 4.7:	Conceptual Tolling Zones and Points

1 Project Management

1.1 Overview

1.1.1 The Developer shall establish and maintain an organization that effectively manages all elements of the Project. This Project management effort will be defined and guided by the Project Development Plans (PDP) as described in the Comprehensive Agreement (Agreement).

1.1.2 Project management activities shall include but not be limited to scope, schedule, cost, and document management, and will be consistent with the Project Work Breakdown Structure (WBS) developed by the Developer.

1.2 Project Administration

1.2.1 General Requirements

The Developer's management approach shall provide all components of an effective and efficient management system, including communication and reporting; documentation of Work; supervision of Work personnel and activities; all equipment, facilities, and materials; environmental protection and mitigation; safety of Work personnel; and any other management elements needed to produce and document a successful quality, safe, efficient, and operable Project.

1.2.2 Submittals

A. The Developer shall draft, revise, and finalize submittals to be accurate, complete, and in a form and at a level of detail to enable the Department to discharge satisfactorily its review and approval obligations. The Developer shall refer to Section 10.05 of the Comprehensive Agreement in regards to the Department's rights in terms of the submittal review process.

B. The Developer shall provide for the transfer of material project records (i.e., hard copies and electronic copies of all correspondence, meeting minutes, emails, and other external documents), in standard business file format, including but not limited to communications between:

1. Governmental Authorities;
2. Business and Project stakeholders;
3. Landowners;
4. News media;
5. Utilities;

6. Transit entities and railroads; and
 7. Community stakeholders.
- C. The Developer shall provide all Design Documentation and Construction Documentation as both hard copy and electronic files sealed by a Professional Engineer as necessary. These documents will be deemed received by the Department upon submission of both electronic and hard copy files, inclusive of all required information necessary to perform a complete review. Hard copy submission packages received after 3:00 p.m. will be deemed received the following business day. The Department will notify the Developer within seven (7) days of submission if the hard copy submission package is incomplete. These documents shall include, but are not limited to, the following items:
1. Design calculations and analysis;
 2. Mix designs;
 3. Reports, studies, and investigations;
 4. Project Schedule;
 5. Design Public Hearing Documentation;
 6. Design Documentation for Project Development Plans;
 7. Detailed design submittal and Approved for Construction (AFC) documents covering individual work packages, construction sketches, shop drawings, and diagrams;
 8. All changes to the AFC documents, including Notice of Design Changes (NDCs), Field Design Changes (FDCs), and Non-Conformance Reports (NCRs);
 9. Soil boring logs, laboratory test results, quality control records and audits, etc.;
 10. Material communications relating to Design Documentation and Construction Documentation;
 11. Responses to review comments from the Department;
 12. Change Orders (including all related communications and dispute resolution proceedings);
 13. Governmental Approvals, and;
 14. Third party approvals.

- D. Design submittals shall be submitted in *.pdf format and hard copy. AFC Documents shall include the CADD files in *.dgn format, *.pdf format, and hard copy. All *.dgn and *.pdf files shall be searchable.
- E. Each electronic file shall be less than 100 Megabytes.
- F. The Department may request the CADD *.dgn files at interim design submittals to facilitate review.
- G. The Developer shall provide five hard copies of all submittal documents for the Department's review.
- H. The Developer shall transfer all electronic document submittals into the Department's Project Electronic Document Management System (EDMS) unless otherwise directed by the Department. E-mail may be used to notify the Department of the availability of the document files.
- I. Whenever the Developer is obligated to make a submittal pursuant to the Agreement, the Developer shall include with such submittal the signed cover sheet described below.
1. A cover sheet, signed by the Developer's Representative, which includes the following certifications:
 - 1.1 The Developer certifies that [description of submittal] was prepared by professionals having the requisite qualifications, certifications, credentials, skills, and experience needed to prepare the submittal in accordance with the requirements of the Agreement and licensed by the Commonwealth of Virginia as required.
 - 1.2 The Developer certifies that it has reviewed the submittal for completeness, the submittal accurately depicts the Work to be undertaken or performed, and the submittal was prepared in accordance to and otherwise complies with:
 - The Agreement;
 - The Technical Requirements;
 - The approved Quality Management System Plan (QMSP);
 - Applicable Law; and
 - Governmental Approvals.

- J. The Developer shall include in the Initial Baseline Schedule, and in all other Project Schedules, all proposed major design and construction submittals that will require the Department's review and approval.
- K. The Developer shall submit to the Department for its review and approval a schedule for the submission of Design Documentation and Construction Documentation. The purpose of this schedule of submissions is to allow for proper allocation of resources by the Department. The schedule of submissions shall be approved by the Department prior to the submission of Design Documentation or Construction Documentation to the Department by the Developer.
- L. Following the commencement of design Work, the Developer shall provide monthly updates to the schedule of submissions referenced above in its Monthly Progress Report. More frequent updates may be requested by the Department. The Developer shall reasonably comply with such update requests.
- M. Unless otherwise approved by the Department, weekly submittal status meetings will be held to review all anticipated submittals, current submittals, and pending re-submittals.
- N. The Department highly recommends and encourages Technical Work Group (TWG) and Over the Shoulder Review (OTSR) meetings with the Developer. The purpose of such meetings would be to address Project concerns, technical issues, requests for information (RFIs), and to facilitate the development and advance review of plans.
- O. If at any given time the Developer makes multiple submittals, the Developer shall indicate to the Department the priority assigned to each submittal to foster a timely and coordinated review by the Department.
- P. Documents that will be reviewed and approved by the Department include the AFC Documentation covering individual work packages including interface points used by the Developer during its design review process, the Design Public Hearing Documentation, other Design Documentation, and all changes to the AFC Plans including NDCs, FDCs, and NCRs.
- Q. The Department may request interim submittals at any time for complex or unusual elements of the Work or for elements where no applicable standards exist. Such interim submittals shall be developed to address the Department's specific requests for information and shall be submitted within 21 days from the request by the Department.
- R. NDCs and FDCs that are required after issuance of the Department's approval of the AFC drawings must be submitted to the Department for review prior to construction associated with the NDC or FDC. All reviews require an accelerated review and approval process. NDC and FDC review/approval shall

be given by the Department within ten (10) days of submittal to the Department. Any basis for disapproval must be submitted to the Developer in writing by the Department.

- S. The Department review and approval shall not relieve the Developer of its obligation to comply with the Agreement.

1.2.3 Plans and Working Drawings

- A. Developer shall furnish all plans and drawings showing such details as are necessary to give a comprehensive understanding of the Work specified. Except as otherwise shown on the plans, dimensions shown on the plans are measured in the respective horizontal or vertical planes. Dimensions that are affected by gradients or vertical curvatures shall be adjusted as necessary to accommodate actual field conditions and shall be specifically denoted on the working drawings.
- B. The Developer shall furnish working drawings to the Department.
- C. Working drawings shall not incorporate any deviations from the Technical Requirements unless the changes are specifically denoted, together with justification, and are approved in writing by the Department in accordance with the Agreement. The Developer shall identify working drawings and submittals by the complete State project and job designation numbers. Items or component materials shall be identified by the specific item number and specification reference in the Agreement.
- D. A Professional Engineer licensed in the Commonwealth of Virginia shall certify working drawings for but not limited to falsework supporting a bridge superstructure; concrete structures and pre-stressed concrete members; lighting, signal, and pedestrian poles; sign structures; breakaway support systems; anchor bolts; toll gantries; reinforced concrete pipe; retaining walls and foundations.
- E. The Developer shall provide five hard copies (in addition to an electronic version submitted via the EDMS) of working drawings for which the Department's review is required in accordance with the Agreement. The Department will return reviewed working drawings to the Developer within fourteen (14) days. If a railroad, municipality, or other entity as specified in the Agreement or on the plans is required to review the working drawings, the Developer shall submit to the Department a plan of operations showing the design and method of proposed operations and shall provide the Department evidence of approval by railroad, municipality, or other entity providing approval before performing any work. The plans shall be clear and legible, and details shall be drawn to scale.

- F. Prior to manufacture of non-standard items, the Developer shall furnish to the Department a certification of the acceptability of the design of such non-standard item, as determined from a review which shall be made on behalf of the Developer by a Professional Engineer licensed in the Commonwealth of Virginia. Such certification shall cover all design data, supporting calculations, and materials. Non-standard designs previously certified or approved by the Department will not require recertification.
- G. The Department's review of the Developer's working drawings will relate only to conformance to and compliance with the requirements of the Agreement. Any deviation from the requirements of the Agreement must be specifically described and accompanied by explicit supporting justification. The Department's review shall not relieve the Developer of responsibility for errors and/or omissions in the working drawings.
- H. The plans and working drawings shall be appropriately signed and sealed by professional licensure, as applicable.

1.2.4 Location of Field Office and Accommodations for Department's Staff during the Design and Construction Period

The Department encourages co-location of its key staff with the Developer during the design and construction period, including the Early Work period. The Department desires to cooperate with the Developer during the design development and review period in order to create efficiencies for the benefit of the Project.

- A. The Developer shall establish one primary field office or dedicated Class B or better office space, the location of which is to be determined and mutually agreed to by the Developer and the Department, but which is expected to be within the Project corridor. This work shall consist of locating, procuring, furnishing, erecting, equipping, maintaining, cleaning (weekdays), and removing and restoring property upon completion of use of the field office. This office shall be for the exclusive use of the Department's staff. The Developer has the option to provide either modular trailers or to rent office accommodations to satisfy the Project office requirements.
- B. The field office shall be available and operational from fifteen (15) days after Financial Close until one-hundred-twenty (120) days after Project Completion. Furnishings and equipment specified shall be in sound and functional condition throughout the duration of the stated period.
- C. The field office shall include the following:
 - 1. Minimum of 150 square feet per person, in order to accommodate a minimum of 25 persons;
 - 2. Minimum of 5 12-foot x 12-foot walled offices with sidelight windows;

3. Minimum of 20 8-foot x 8-foot cubicles or work areas with work surface (desks), cabinets and drawers, and other standard items in office cubicles including cubicle walls minimum 60 inches tall;
4. All equipment supplied for the field office shall be new and not used or reconditioned;
5. Standard office furniture, office supplies, and office implements (including but not limited to items such as a desk sized 60 inches x 34 inches, ergonomic chairs with rolling casters, rolling pad, desk lamps, and office equipment and supplies such as staplers, tape dispenser, scissors, pens, mechanical pencils, paper, note pads, fasteners, markers, etc.);
6. One 4-drawer metal file cabinet per office and cubicle;
7. One six-foot 4/5-shelf bookcase per office and cubicle;
8. One 24-inch x 36-inch dry erase board with eraser and markers per office and cubicle;
9. One computer or laptop connection per office or cubicle;
10. Networking and internet capabilities for all computer connections and copying equipment;
11. Infrastructure and access capabilities to the internet. High-speed internet access for Department staff shall be through a secure network;
12. Two black and white multi-function copier/printer/scanner machines networked to all offices and cubicles with the following minimum features: capable of copying 8½ inch x 11 inch up to 11 inch x 17 inch documents, sorter, automatic feed and paper selection, and magnification and reduction;
13. One color laser multi-function copier/printer/scanner machines networked to all offices and cubicles with the following minimum features: capable of coping 8½ inch x 11 inch up to 11 inch x 17 inch documents, sorter, automatic feed and paper selection, and magnification and reduction;
14. Two B/W laser printers and one color laser printer with wireless access for all users with 8½ inch x 11 inch up to 11 inch x 17 inch documents;
15. One large format color DesignJet printer/plotter HP T7200 Series or better networked to all offices and cubicles;
16. Continual supply of all paper, replacement ink, and other supplies for all printers including complete service contracts for each device;

17. One microwave oven with a minimum 1,000 watts;
18. One full-size refrigerator (minimum 18 cubic feet with ice maker);
19. One wastebasket per office and cubicle;
20. First Aid kit(s) sized and designed for the minimum staff number and containing eye and skin protection for emergencies;
21. Smoke detectors and fire extinguishers in accordance with local codes;
22. Installation and payment of phone service available for each office or cubicle, with answering and message services;
23. Installation and payment of High-Speed internet service available for each computer;
24. Installation and payment of utilities to operate all field office functions;
25. Minimum 30 parking spaces readily adjacent to the office structure;
26. Minimum one 14-foot x 24-foot primary conference room with conference table(s) and rolling caster ergonomic conference chairs to seat 25 people. Conference room to be supplied with phones suitable for conducting conference calls; video projection devices, one minimum 60-inch flat panel LCD television/monitor; two dry erase boards, wall mounted, minimum 25 square feet, with erasers and markers;
27. Minimum four conference rooms with seating for 10 people with same features as the primary conference room minus one dry erase board;
28. Common area space for multiple purpose use minimum 30 foot by 40 foot open floor space;
29. Two plan racks for 24-inch x 36-inch drawings with 12 plan clamps;
30. Ten six foot 4/5 shelf bookshelves for the common area of the office;
31. Ten 4-drawer metal file cabinets for the common area of the office;
32. Ten 4 foot x 8 foot folding tables with six metal folding chairs per table for the common area of the office;
33. Receptionist area with 10-foot x 10-foot counter style work area including chair, equipment, internet and printer connectivity like the office and cubicles;
34. Water coolers or continual supply of bottled water adequate for 40 people;

35. A watertight office structure with a robust HVAC system to maintain a temperature range of 70-72 degrees Fahrenheit in all areas of the office throughout all seasons;
 36. Adequate separate lavatory facilities to account for a minimum of 25 personnel, both men and women;
 37. All utility (electric, gas, water, sewer, telecommunications, phone) feeds, connections, disconnections, and bill payments shall be borne by the Developer;
 38. A 14-foot x 16-foot kitchen area with a sink and one lunch-style table and chairs to seat a total of 6 people;
 39. A 12-foot x 14-foot storage room with a door having a locking assembly, and 10 spare keys that shall be provided to the Department;
 40. Adequate number of windows to allow for natural light entrance per local architectural standards or building code;
 41. Adequate overhead lighting in all parts of the office per architectural standards;
 42. Exterior doors that shall be equipped with adequate locking assemblies, and 30 spare keys that shall be provided to the Department;
 43. One paper shredder;
 44. Weekday janitorial services including cleaning and recycling;
 45. Exterior way finding and Project office identification signage; and
 46. All aforementioned requirements shall be in compliance with and pursuant to the Americans with Disabilities Act (ADA). Any conflict between the ADA requirements and those listed under this section shall be resolved in favor of the more stringent requirement.
- D. The Developer shall provide storage facilities for the Department's nuclear gages which shall not be within 10 feet of any structure. The facility shall be provided with electrical power and shall be equipped for an interior switched light and two 120V, 20 amps, grounded, weatherproof, duplex receptacle for recharging up to 4 gages. The storage facility for the nuclear gages shall be weatherproof, tightly floored and roofed, having a tamper resistant key operated lock with 4 keys furnished to the Department. The Developer shall install 4 fixed restraining bars for locking of individual nuclear gages with the storage facility.

- E. The field office and equipment as required herein shall remain the property of the Developer.
- F. The field office shall be separated from buildings and trailers used by the Developer. The Developer's construction staff shall be housed in field offices located on or adjacent to the Project.
- G. The Developer shall provide and maintain in a neat, sanitary condition such accommodations for the use of its employees, as well as the employees or agents of the Department, as may be needed to comply with the requirements of applicable Law.
- H. The field office shall be weatherproof, tightly floored and roofed, constructed with an air space above the ceiling for ventilation, supported above the ground, and anchored against movement. The floor-to-floor ceiling height shall be at least 7 feet 6 inches. The inside walls and ceilings shall be constructed of Masonite, gypsum board, or other similarly suitable materials as permitted by fire and building codes. The exterior walls, ceiling, and floor shall be insulated.
- I. In regard to lighting, heating, and air conditioning, the field office shall have satisfactory functional lighting, electrical outlets, heating equipment, an exhaust fan, and air conditioner connected to an operational power source. There also shall be at least one 100-watt exterior light fixture at each exterior doorway. Electrical power and fuel for heating equipment shall be furnished by the Developer.
- J. The Developer shall coordinate final minor details regarding the field office space with the Department prior to the Department staff occupying the space.

1.2.5 Electronic Document Management System

- A. The Developer shall establish and maintain an EDMS for Project-specific needs only to store and record all material documents generated on the Project, including those records required under law.

Any information stored on this EDMS shall be subject to the Freedom of Information Act (FOIA) as governed by the Code of Virginia, unless a timely request for exemption, citing the specific FOIA exemption provision, is received and approved by the Department. For purposes of this clause, "timely" shall mean any time prior to receipt of a FOIA request by the Department for records that the Developer claims are exempt.

- B. Unless otherwise directed by the Department, the Project shall use an internet-based EDMS called CADAC Organice (CADAC) for submitting, managing, tracking, and controlling all transmittals, submittals, design drawings, reports, correspondence, and other pertinent Project documents transmitted between the Department and the Developer in accordance with Attachment 1.5.

1. CADAC access will be provided at no cost to the Developer.
2. CADAC will become the final repository of all Project documentation.

C. In the provision of an EDMS, the Developer shall:

1. Use data systems, standards, and procedures with consistent naming and searching protocols;
2. Ensure document retention for any minimum statutory period(s);
3. Provide a secure EDMS, such that only authorized users have access and that it is protected from theft, damage, and unauthorized or malicious use;
4. Provide a mechanism (mutually agreed by both parties) for the electronic transfer of metadata along with the associated document in standard business file format for uploading into the EDMS employed by the Department; and
5. Provide the Department with written procedures and training of staff who will be required to access all relevant documents generated under the Agreement. All electronic information submitted to the Department shall be searchable and legible to the extent practical.

D. In the relevant PDP, the Developer shall describe:

1. The specific EDMS tool to be used by the Developer and the access methods available to the Department and others that may need access to the system;
2. Methods by which all documents issued and received by the Developer shall be uniquely coded and retrievable in a user-friendly format;
3. Routing, filing, control, search capabilities, and retrieval methods for all documents;
4. Methods to facilitate data sharing, including written procedures for accessing and searching all documents by all Project team members; and
5. Upon completion of the Project, the transfer of EDMS data and files such that the Department has a complete set of material Project documentation in electronic format and written documentation on the contents of the data.

1.2.6 Project Meetings

- A. Authorized Representatives and other pertinent representatives of the parties shall meet within ten (10) days after the earlier of (1) Limited Notice to Proceed, issued in accordance with the Agreement, or (2) the Financial Close Date, to

discuss issues affecting the administration of the Work and to implement the necessary procedures, including those relating to submittals and approvals, and to facilitate the ability of the parties to perform their obligations under the Agreement.

- B. Within fourteen (14) days, or other period of time as mutually agreed by the parties, after the satisfaction of the conditions precedent to begin construction as set forth in the Agreement, the parties and their respective representatives shall conduct a pre-construction meeting to discuss the Developer's planned construction operations. At the pre-construction meeting, the parties shall discuss, among other things, the sequence of the Work; scheduling; constructability issues; coordination with governmental agencies, transit and railroad entities, and utility companies; and maintenance of traffic and quality assurance and quality control procedures.
- C. The Developer shall hold monthly progress meetings with the Department. During such meetings, Work completed during the prior month, Work scheduled and underway during the current month, Work to be undertaken during the next month, and issues encountered or anticipated issues shall be reviewed. The Developer shall collect and report on pertinent information from any Contractors responsible for Work completed during the specified duration and Work scheduled during the upcoming reporting duration. These meetings shall be attended by the Developer Representative and other personnel as requested by the Department, including relevant Contractors. Meetings will occur monthly beginning the month after the first Limited Notice to Proceed is issued and shall continue until Project Completion. The Developer shall be responsible for preparing, maintaining, and distributing minutes of the meetings to all attendees for review. The meeting minutes shall be provided to the Department within 3 days after the monthly progress meeting or such other time frame as approved by the Department. The parties occasionally may cancel a monthly progress meeting if they mutually agree that such meeting is not necessary.
- D. The Department and Developer shall agree to other meetings as appropriate.

1.3 Project Development Plans

1.3.1 General

- A. The Developer shall provide PDPs that comply with the requirements set forth in Attachment 1.3.
- B. PDPs shall not obligate the Department to perform any activity unless agreed to in writing by the Department.

1.3.2 Project Development Plans

- A. The Developer shall produce and maintain a quality control and quality assurance system for the PDPs. This shall include current documentation showing its internal quality reviews and results of compliances, non-compliances, and corrective actions taken.
- B. The Department may audit and monitor the activities described in the PDPs to assess the Developer's compliance.
- C. All statements and procedures contained in the PDPs shall be of an auditable nature.
- D. The PDPs and updates shall be made available to the Department in electronic format and hard copies, as requested.

1.3.3 Project Development Plan Updates

- A. The Developer shall update and improve the effectiveness of its PDPs and have mechanisms in place to monitor progress and identify opportunities for improvement.
- B. A PDP or procedure shall be updated pursuant to Attachment 1.3, if such PDP or procedure:
 - 1. Does not adequately address the matters it is intended to address;
 - 2. Does not conform or is otherwise necessary to comply with the Agreement;
 - 3. Has to be changed because of an audit;
 - 4. No longer represents current or appropriate practice; or
 - 5. Is required by the Agreement to be updated.

1.3.4 Submission Timetable

The PDPs shall be submitted in accordance with Attachment 1.3 for Department review and approval.

1.4 Schedules

1.4.1 Project Schedules

- A. The purpose, format, and content of the Project Schedule shall be as follows:

1. Terms not defined herein or in the Agreement shall have the same meanings ascribed to them in the AACE International Recommended Practice No. 10S-90 (“Cost Engineering Terminology”).
2. The purpose of the Project Schedule is to ensure that adequate planning, scheduling, and resource allocations occur to provide a reasonable and executable work plan, cash flow projections, and continuous monitoring and reporting for Work performed or remaining. The Baseline Schedule and the monthly updates to the Project Schedule shall be used for coordinating the Work, monitoring the progress of Work performed, identifying Work to be performed, evaluating changes, and as a tool for measuring progress.
3. Project Schedules will be reviewed in accordance with the VDOT Post-Award Scheduling Guide and the AACE Recommended Practice No. 53R-06 as appropriate. Acceptance by the Department of any Project Schedule will not relieve the Developer from its responsibility to complete all Work within the Project Schedule. In addition, the Department’s acceptance of any Project Schedule creates neither a warranty, expressed or implied, nor an acknowledgment of the reasonableness of the activities, logic, durations, or cost loading of the Developer’s Project Schedule. Furthermore, acceptance of the Project Schedule will not relieve the Developer from complying with all the requirements of the Agreement, including, without limitation, requirements, sequences, constraints, and obligations.

B. As general requirements of the Project Schedule, the Developer shall:

1. Ensure that the actual number of activities in the schedule is sufficient to assure adequate planning of the Work and to permit monitoring and evaluation of progress and perform the analysis of alleged time impacts;
2. Ensure that design activities identify AFC Documents;
3. Apply the Critical Path Method (CPM) of network calculation to generate the Project Schedule (the Critical Path shall be based on the longest network path through the Project) and prepare the Project Schedule using the Precedence Diagram Method (PDM) to establish relationships and interdependencies between the individual activities required to complete the Project;
4. Ensure that activity identification numbers, textual descriptions, and codes are consistently applied in the Project Schedule and are unique for each specific activity;
5. Divide all Work prior to the Project Completion Date into activities with appropriate logic ties to show the Developer’s overall approach to

sequencing, including logical relationships between activities reflecting the Developer's actual intended sequence of Work; and logically tie all activities to avoid open ends;

6. Show the Project milestones, including commencement of design Work; the anticipated issuance of Limited Notice to Proceed, Intermediate Milestone dates; Service Commencement, and Project Completion Dates;
 7. Show phasing of the Work as detailed in the design plans, subcontractor work, procurement, fabrication, delivery, installation, testing of materials and equipment, commissioning of systems, and any long-lead time orders for major or significant materials and equipment;
 8. Allocate an estimated cost and planned value to the appropriate lowest level elements (activities) of the WBS;
 9. Reflect the required coordination with other Department contractors, utility owners, governmental agencies, transit entities and railroads, engineers, architects, contractors, and suppliers;
 10. Identify regulatory approvals and Department inspections required and the dates by which such approvals and inspections are necessary;
 11. Be fully compliant with the Agreement;
 12. Conform to the Work Restrictions and Maintenance of Traffic requirements;
 13. Reflect the Right-of-Way (ROW) Acquisition and Relocation Plan; and
 14. Reflect the Utilities Plan.
- C. The Monthly Progress Earning Schedule is based on cost data generated from the Project Schedule and shall depict planned progress based on anticipated earnings. The Monthly Progress Earning Schedule shall depict monthly comparisons of actual versus planned progress, including illustrating the schedule variance graphically by plotting the Budget Cost of Work Performed (BCWP) and the Budget Cost of Work Scheduled (BCWS) and reporting the Schedule Performance Index (SPI). The SPI is defined as the ratio of BCWP divided by BCWS for the Project to date and the monthly projections through Project Completion. For each occurrence of Major Maintenance or construction of a Developer Project Enhancement during the Operations Period, the Developer shall follow the principles above for the preparation and approval of a Project Schedule relating to such Work and will perform progress monitoring and reporting.

- D. The scheduling software employed by the Developer shall be compatible with the Department's scheduling software. The Developer's scheduling software must have the capability to import and export data in the Primavera proprietary exchange format (*.xer). As of the Agreement Date, the Department's scheduling software is Primavera Project Management software (P6).
- E. Float available in the Project Schedule, at any time, shall not be considered for the exclusive use of either the Department or the Developer. During the course of the Work, any float generated is not for the sole use of the party generating the float; rather it is a shared commodity to be reasonably used by either party. A schedule showing work completing in advance of the Project Completion Date, and accepted by the Department, will be considered to have Project float. Project float will be a resource available to both the Department and the Developer. No time extensions will be granted unless a Delay Event occurs that impacts the Project's Critical Path, consumes all available float or contingency time, and extends the work beyond the Project Completion Date as defined by the Agreement. The Project Schedule shall not use float suppression techniques.
- F. The Developer shall exercise resequencing logic to mitigate any Delay Event before requesting any extension.
- G. If the parties cannot agree to a Schedule, either party may refer the disagreement to the dispute resolution procedures set forth in the Agreement.
- H. The Developer shall maintain at all times, at its office, a minimum of 1 hard copy complete set of all schedule reports shown above. All schedule reports shall be available to the Department for inspection and audit. Additional reports may be required as future needs dictate.

1.4.2 Initial Baseline Schedule

- A. The Initial Baseline Schedule is the Developer's conceptual plan for the design and construction of the Construction Project. This schedule shall be used to monitor performance of the Work until the Baseline Schedule is approved by the Department.
- B. The Initial Baseline Schedule shall be submitted within thirty (30) days of the Agreement Date.
- C. The Initial Baseline Schedule, which should outline the Developer's proposed plan to accomplish the Work, shall be in the same general format as the Baseline Schedule, as described in the Technical Requirements. The Initial Baseline Schedule shall include at least the following:
 - 1. Schedule activities representing all Work to the WBS Level as set forth in Section 1.4.1.

2. Individual cost loaded Schedule activities, designated as payment activity at WBS Level as set forth in Section 1.4.1.
3. The Initial Baseline Schedule does not need to be resource loaded.

1.4.3 Baseline Schedule

- A. Within one hundred fifty (150) days of the Agreement Date, the Developer shall submit to the Department for its review and approval a proposed Baseline Schedule, which shall include the Developer's detailed plan for design and construction of the Project. The Developer shall develop its proposed Baseline Schedule from the Initial Baseline Schedule. The Developer shall submit to the Department 6 hard copies (printed on 11-inch x 17-inch paper) of its proposed Baseline Schedule, along with an electronic version of the proposed Baseline Schedule created in the Primavera proprietary exchange format (*.xer).
- B. Within twenty-one (21) days of the Department's receipt of the proposed Baseline Schedule, the Department will notify the Developer in writing of its approval or disapproval of the proposed Baseline Schedule, and of any comments it has or amendments it wishes the Developer to make. The Developer shall give due consideration to the Department's suggested amendments or comments and, to the extent it deems appropriate, revise the proposed Baseline Schedule and re-submit the same to the Department for its review in accordance with this Clause B for the Department's approval. Within fourteen (14) days of the Department's receipt of the re-submitted proposed Baseline Schedule, the Department will notify the Developer in writing of its approval or disapproval. Upon approval by the Department, the proposed Baseline Schedule will become the Baseline Schedule.

If the parties cannot agree to a mutually acceptable Baseline Schedule, either party may refer the disagreement to the dispute resolution procedures set forth in the Agreement. Until such time as the dispute is resolved, the Initial Baseline Schedule will be used for the design and construction of the Project. The Baseline Schedule shall include an organized WBS, the development of which is based on a deliverable-oriented methodology that captures all the Project activities. The WBS shall allow schedule summarization at a minimum of four hierarchical WBS levels, such as: Project areas (Level 1), WBS elements (Level 2), work packages and deliverables (Level 3), and the detail control level (Level 4) to which the individual schedule activities are assigned their WBS code.

- C. Activities in the Baseline Schedule shall be assigned project-specific activity codes.
- D. The Baseline Schedule shall include all major activities of the Work in sufficient detail to enable the Department to monitor and evaluate design and construction progress from the Financial Close Date until Project Completion.

- E. The Baseline Schedule shall include separate activities for major submittals proposed by the Developer, together with appropriate activities for the Department's review or approval, provided that such review and approval times by the Department will be no less than the time provided for such reviews in the Agreement.
- F. The Baseline Schedule shall be resource-loaded with estimated quantities, broken down into work packages and deliverables generally completed in not less than one but no more than 20 days, or as mutually agreed (unless such deliverable is a procurement or other non-construction activity), with dollar value (price) of each appropriate lowest level element of the WBS identified. The total cost loaded into the Baseline Schedule shall be equal to the total cost of the Design-Build Contract.
- G. The Work shall be broken down in sufficient details to identify the phase, stage, feature, type of Work, deliverable, and specific location in which the Work occurs, including as applicable:
1. Project milestones;
 2. Administrative activities such as key submittals, notifications, and review by the Department, the Federal Highway Administration (FHWA), and other regulatory agencies;
 3. Design activities showing all Work required to complete each stage of design and deliverable;
 4. Public involvement activities;
 5. Environmental and permitting activities;
 6. ROW acquisition activities showing all parcels;
 7. Utility relocations and adjustments, including all specific types and locations;
 8. Procurement, fabrication, and delivery activities of materials;
 9. Construction start-up activities such as mobilization, staging areas, surveying, clearing and grubbing, construction access, etc.;
 10. Maintenance of Traffic (MOT) activities;
 11. Construction activities broken down by phase stage, feature, type of work, specific location, etc. as applicable;
 12. Other necessary miscellaneous activities that consume time, for example, installation and removal of temporary systems or structures such as

shoring, load tests, curing, demolition, testing and acceptance periods including all activities necessary for the complete testing and inspection of all Work as necessary to achieve proper activation and use of the Work, punch list, clean-up, demobilization, etc.

- H. Activity calendars shall be assigned using project-level calendars. Use of global calendars is not allowed and shall be cause for rejecting the schedule. Activity codes shall be defined and assigned to the individual activities to allow for filtering, grouping, and sorting of activities by project phase, responsibility, area, phase, stage, feature, work type, Change Orders, Disadvantage Business Enterprise, and other major work category, as applicable. Activity codes shall be assigned using project-level activity codes. Use of global activity codes is not allowed and shall be cause for rejecting the schedule.
- I. Constraints shall be used sparingly and on a case by case basis, as necessary. Constraints such as “Mandatory Start” or “Mandatory Finish” that violate network logic are not allowed and shall be cause for rejecting the schedule. If the Agreement includes a specified “start-no-earlier than” milestone, then the Agreement milestone activity shall be constrained with a “start on or after” constraint, with a date equal to the date specified in the Agreement. If the Agreement includes a specified Intermediate Milestone or Project Completion milestone, then the Agreement intermediate completion milestone activity or Project Completion milestone activity shall be constrained with a “Finish On or Before” constraint, with a date equal to the date specified in the Agreement.
- J. The Project schedule software settings shall be defined according to the following Primavera (P6) settings:
 - 1. Schedule dates shall be shown in the “Month-Day-Year” date format, with two-digit numbers for the month, day, and year (e.g., 05-01-13).
 - 2. Duration type for all activities shall be specified as “Fixed Duration & Units.”
 - 3. The “Drive activity dates by default” checkbox in the Project Details **Resources** tab shall be marked.
 - 4. The “Link Budget and At Completion Cost for not started activities” checkbox in the Project Details Calculation tab shall be marked.
 - 5. The “Reset Remaining Cost and Units to Original” in the Project Details Calculation tab shall be specified.
 - 6. The “Subtract Actual from At Completion” under “When updating actual units or costs” in the Project Details Calculation tab shall be specified.

7. The “Recalculate Actual Units and Cost when duration % complete changes” checkbox in the Project Details Calculation tab shall be marked.
 8. The “Update units when costs changes on resource assignments” checkbox in the Project Details Calculation tab shall be marked.
 9. The “Link Actual and Actual This Period Units and Cost” checkbox in the Project Details Calculation tab shall be marked.
 10. Specify “Retained Logic” in the Scheduling Options dialog box for scheduling progressed activities.
 11. Specify “Longest Path” in the Scheduling Options dialog box for defining critical activities.
 12. Specify “Finish Float = Late Finish – Early Finish” in the Scheduling Options dialog box as the schedule calculation option to compute total float.
- K. The Project Schedule shall be calculated using the precedence diagram network logic method and the CPM. The use of resource-levelling to determine sequence, order, or timing of the activities is not allowed and shall be cause for rejecting the Schedule.

1.4.4 Monthly Progress Reports and Project Schedule Updates

- A. Monthly Progress Reports shall have a reporting period ending on the last day of each calendar month and shall be submitted on or before the 15th of the month following the reporting period.
- B. During the Construction Period, the Developer’s Monthly Progress Report shall include the following:
 1. Document control certification sheet (verification that all field documentation is being maintained);
 2. Specific construction activities and deliverables occurring during the previous month (reporting period);
 3. Specific construction activities and deliverables planned for the next two reporting periods;
 4. Progress narrative that describes, at a minimum, the overall progress for the preceding month, a Critical Path analysis, a discussion of problems encountered and proposed solutions thereof, any pending delay analysis or Time Impact Analysis (TIA), and float. With each submission of the Project Schedule, the Developer also shall include:

- 4.1 Two sets of compact disks containing an electronic working copy of the Project Schedule (in *.xer file format). Each submission shall have a unique file name to indicate the type and order of submission. Each compact disk shall be labeled to indicate the type of submission, file name, and schedule data date.
- 4.2 A narrative progress report of the Project Schedule that describes, at a minimum, the Developer's plan of operation for meeting the Intermediate Milestones and the Project Completion Date, an evaluation of the Critical Path, a discussion of Project-specific issues encountered since the last submission as such issues relate to the schedule, proposed solutions thereof, work calendars, constraints, delays experienced, and the status of any submitted or pending Schedule Impact Analysis (SIA), float consumption, documentation of any logic changes, duration changes, resource changes or other relevant changes.
- 4.3 Time-scaled logic diagram indicating the Critical Path, early start and early finish dates, and total float, sorted and grouped by the WBS.
- 4.4 Tabular schedule reports sorted by total float, work areas, and a detailed predecessor and successor report sorted by activity number. The tabular schedule reports also must include the schedule of values and major work item quantities generated from the Project Schedule. For each WBS, the cost reports shall depict the activity number, description, original duration, percentage completion, original budgeted cost, cost this period, cost to date, and cost to complete.
5. A comparison of actual and planned progress, including illustrating the schedule variance graphically by plotting the BCWP and the BCWS and reporting the SPI, which is defined as the ratio of BCWP divided by BCWS;
6. Identification of activities requiring Department and FHWA input or assistance, to the extent reasonably known;
7. Action items and outstanding issues;
8. A WBS Level 1 or Level 2 or Level 3 or Level 4 design and construction schedule;
9. Project cost summary;
10. Quality management reporting, as defined within the Developer's QMSP, including quality inspection reports and daily inspection reports;

11. A statement by the Developer that the Baseline Schedule is the schedule being executed to perform the Work;
12. NCRs and resolution reports;
13. ROW acquisition activities;
14. Environmental permitting and compliance activities;
15. Utility relocation activities;
16. Disadvantage Business Enterprise (DBE) and Small, Women-owned, and Minority-owned Business (SWaM) quarterly usage;
17. Safety activities;
18. Digital photographs of the progress of the Project; and
19. A summary of any outstanding potential issues, any Delay Events or Compensation Events and the measures adopted (or to be adopted) to overcome such issues.

C. Project Schedule Updates shall include the following:

1. Developer shall update the Project Schedule monthly to reflect actual progress to date and to forecast progress going forward (the “Project Schedule Updates”). The Project Schedule Update shall be submitted as an attachment to the Monthly Progress Report. The last day of the reporting period shall be the status date or data date used to calculate the schedule. Project Schedule Updates shall comply in all respects with the schedule requirements set forth in this section.
2. The Approved Initial Baseline Schedule will be the basis for Project Schedule Updates until such time as the Baseline Schedule is approved by the Department. Thereafter the Baseline Schedule shall be the basis for Project Schedule Updates.
3. Project Schedule Updates shall depict activities that have started, are ongoing, or completed as of the new data date; show actual start dates for activities that have started; and show actual finish dates for completed activities.
4. Project Schedule Updates shall depict percent complete for ongoing activities. Activity percent complete for work-in-place shall be based on the amount of work completed relative to the total amount of work planned for the activity.

5. Project Schedule Updates shall depict remaining duration for ongoing activities. Remaining duration for unfinished activities shall be based on the amount of time required to complete the remaining work as of the new data date.
 6. Activity relationships for the remaining activities shall be modified as necessary to correct out-of-sequence progress for ongoing activities or to reflect the Developer's current plan for completing the remaining Work.
 7. All changes to the Project Schedule shall be documented in detail in the Monthly Progress Report. Such changes include but are not limited to additional, revised, or deleted activities; durations; calendar assignments; or logic ties.
 8. The Project Schedule Update submitted with the last Monthly Progress Report will be identified by the Developer as the Developer's as-built Schedule.
 9. If the Department requests that the Monthly Progress Report needs a specific revision, the Developer shall make the requested changes within five (5) days after receiving the Department's request or such other time frame as mutually agreed between the parties. If the Developer objects to the Department's request for revisions, the Developer may refer the matter to dispute resolution pursuant to the Agreement.
- D. During the Construction Period, in addition to the monthly progress reports, the Developer shall provide a weekly report, which shall include the following:
1. Specific construction schedule activities, including location for the week concluding and the upcoming week;
 2. Rolling 3-week forward-looking inspection notice, which shall include the fabrication schedule and planned construction activities; and
 3. MOT weekly update, regarding any scheduled lane closures and identification of work areas for the ensuing two (2) weeks.

1.4.5 Revisions to Baseline Schedule

- A. If the Department determines the Baseline Schedule needs a specific revision either in logic, activity duration, WBS, or manpower, the Developer shall make the requested revisions within 10 days after receiving the Department's request or such other timeframe as mutually agreed between the parties. Once approved, this update shall then become the Baseline Schedule. At no time shall the Developer continue to reflect an item of non-concurrence from the Department in the updates to the Baseline Schedule, provided that if an item of non-concurrence has been referred to dispute resolution, then the Developer shall

continue to perform its Work in accordance with the then current Baseline Schedule in effect until such time as the dispute is resolved and an updated Baseline Schedule is agreed to. If the Developer objects to the Department's request for revisions, the Developer may refer the matter to dispute resolution pursuant to the Agreement.

- B. In the event of a Delay Event for which the Department grants relief from the Project Completion Date to the Developer in accordance with the terms of the Agreement, the Baseline Schedule will be revised to reflect the relief granted and submitted to the Department for approval in accordance with the Agreement.

1.4.6 Project Recovery Schedule

- A. Pursuant to the Agreement, whenever the Monthly Progress Report shows the Project Completion Date has sixty (60) days of negative float, the Developer shall submit a project recovery schedule to the Department for approval. Project recovery schedule submittals shall include a list of all activities changed, added, or deleted, along with all logic changes and an accompanying narrative explaining the nature of the changes.
- B. Once a Project recovery schedule is reviewed and approved by the Department, it shall become the Baseline Schedule and be used as the basis for subsequent Monthly Progress Reports. The Developer shall archive all approved Project Schedules.

1.4.7 Schedule Impact Analysis (SIA)

- A. Time Impact Analysis (TIA) for Proposed Extensions of Time (Prospective)

In conjunction with the submission of a proposed change, the Developer shall submit any proposed schedule impact as a result of impacts it claims to the Critical Path, if any, that the proposed change will create, in the TIA format, as prescribed in **AAACE Recommended Practice 52R-06** and submitted as outlined herein.

The following shall apply if a TIA is required by the Agreement:

1. The TIA shall be based on the date on which the implementation of such change is proposed to begin.
2. The TIA shall show the current status of the Work using the current Baseline Schedule. The time computation of all affected activities shall be shown in the TIA along with a demonstration of steps used to mitigate impacts.

3. Each TIA shall include a Fragmentary Network (or fragnet) demonstrating how the Developer proposes to incorporate the impact into the Baseline Schedule. A fragnet is defined as the sequence of new activities or activity revisions, logic relationships, and resource changes that are proposed to be added to the existing schedule to demonstrate the influence of impacts to the schedule. The Developer understands it has a duty to mitigate any and all alleged delay events, whether prospective or retrospective, and such analysis will take advantage of the factual events leading to the alleged delay impacts; take into consideration all possible mitigation methods, techniques, and available resources, including but not limited to logic changes, resource allocations, activity durations, and consideration of calendar changes. The fragnet shall identify the predecessors to the new activities and demonstrate the impacts to successor activities. The Developer shall insert the fragnet into the Baseline Schedule, run the schedule calculations, and submit the impacted schedule in accordance with this section. The Developer shall include a narrative report describing the effects of new activities and relationships to Agreement milestones and the Project Completion Date with each TIA.
4. Except as provided in the Agreement, the Developer shall not be entitled to any extension of the Term automatically as the result of an activity delay. The Developer recognizes that certain events will not affect the existing critical activities or cause non-critical activities to become critical, thereby not causing any effect on the Project Completion Date.
5. Two copies of each TIA report together with an electronic file (in *.xer file format) of the Project Schedule impact analysis shall be submitted to the Department in accordance with the Agreement.
6. Upon approval, a copy of the TIA signed by the Department will be returned to the Developer and incorporated into the next update to the Baseline Schedule. The TIA will be reviewed by the Department in accordance with AACE International Recommended Practice No. 52R-06 “Time Impact Analysis as Applied in Construction.”
7. A TIA will be approved or disapproved by the Department in its reasonable discretion within 21 days following receipt thereof, unless subsequent meetings or negotiations are necessary. The approved TIA related to a Change shall be incorporated into and attached to the applicable Change Order. A disapproved TIA will be returned to the Developer with appropriate comments for revisions or the Department’s basis for denying the alleged Delay Event. If no agreement is reached, either party may refer the matter to dispute resolution pursuant to the Agreement.

B. Delay Event Claim Analysis (Non-Prospective)

In the event of a claimed Delay Event that the Developer alleges has impacted the Critical Path of the Project, the Developer shall, in accordance with the Agreement, prepare a delay claim analysis using a retrospective observational analysis format as prescribed by the AACE 29R-03 Recommended Practice for Forensic Schedule Analysis. Such analysis will take advantage of the factual events leading to the alleged delay impacts; take into consideration all possible mitigation methods, techniques, and available resources; and minimize any prospective analysis or conclusions.

1.5 Standards and Specifications

1.5.1 General Requirements

- A. The Work shall conform to the Standards and Specifications set forth in the Agreement and Attachment 1.5, considering lifecycle and operations and maintenance requirements. Where the Developer's design requires design methods or construction procedures not covered by the attached list of Standards and Specifications, the Developer shall obtain the Department's approval before using such methods or procedures. The 21-day deemed approval clause shall not apply to this provision. The Department will not unreasonably withhold or delay approval. The Developer's obligations to conform the Work to the requirements set forth in manuals described in the Agreement and Attachment 1.5 will be satisfied if the Work meets the engineering objectives set forth in such manuals.
- B. Subject to the provisions of the Agreement, Work carried out during the Operations Period shall comply with the Department's then-current Standards and Specifications, including any revisions or supplements. The Developer shall request Department approval for the use of non-Department standards if specific Department standards do not exist prior to design and construction.
- C. The Developer shall derive the functional classifications, design speeds, special load requirements, design criteria, and other applicable design issues using the Technical Requirements and the Standards and Specifications set forth in Attachment 1.5. The Developer shall convert metric units to English units, as applicable.

1.5.2 Interpretation of Standards and Specifications

- A. Department Standards for Performance are interpreted using the following guidelines: The Virginia Department of Transportation Road and Bridge Standards and the Virginia Department of Transportation Road and Bridge Specifications; supplemental specifications, special provisions, and special provision copied notes issued by the Department; and the Standards and Specifications and supplementary reference documents listed in Attachment 1.5

to these Technical Requirements. A requirement occurring in one shall be as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete Project. Department standards shall take precedence over AASHTO standards unless otherwise noted. In case of a discrepancy, the following order of priority will apply, with the highest governing item appearing first and the least governing item appearing last:

1. Technical Requirement stated in this Exhibit C
2. Special provision copied notes issued by the Department
3. Special provisions issued by the Department
4. Supplemental specifications issued by the Department
5. Standards and Specifications listed in Attachment 1.5
6. Reference documents listed in Attachment 1.5

Design Documentation

- B. Each party shall promptly notify the other party if it discovers an obvious and plain error or omission in the text of the Technical Requirements attributable to a word processing, administrative, or similar oversight. The parties will then coordinate to make such corrections as are necessary to restore the intent of the language.
- C. The standards, special provisions, and reference guidelines applicable for the Construction Period shall be the version of those documents as listed in Attachment 1.5, including all supplements, errata, revisions, and interims.
- D. Following the Work period, all subsequent design and construction shall meet the standards current at the time the Work is performed. It is the responsibility of the Developer to ensure that all relevant standards and specifications have been applied.

1.6 Right-of-Way

1.6.1 General Requirements

- A. General: Terms not defined herein or in the Agreement shall have the same meanings ascribed to them in the VDOT Right of Way Manual of Instructions.
- B. The Developer's Technical Concept Plans shall be contained wholly within the ROW limits shown on the Request for Proposal (RFP) Conceptual Plans, with the exception of temporary construction, permanent drainage (other than permanent drainage easements for stormwater management facilities), and

utility easements. Stormwater management facilities shall be contained wholly within the ROW limits shown on the RFP Conceptual Plans. Utility easements have not been identified yet or shown on the RFP Conceptual Plans. Deviations in excess of the proposed ROW limits shown on the RFP Conceptual Plans will be subject to Department approval.

The Developer's final design shall also be contained within the ROW limits shown on the Developer's Technical Concept Plans, with the exception of temporary construction, permanent drainage, and utility easements (other than permanent drainage easements for stormwater management facilities) and where minor adjustments are required during final design process, and only after approval from the Department. If the Developer proposes significant changes that exceed the ROW limits shown on the Developer's Technical Concept Plans, then these changes shall be subject to Department approval. The Developer shall be responsible for any time or cost impacts and any National Environmental Policy Act (NEPA) document re-evaluation associated with Developer's design changes that extend beyond the ROW limits reflected in the RFP Conceptual Plans and approved by the Department.

- C. The Developer, acting as an agent on behalf of the Commonwealth of Virginia (Commonwealth), shall provide all ROW acquisition services for the Project's acquisition of fee ROW and permanent, temporary, and utility easements. ROW acquisition services shall include attorney-certified title reports, appraisal, appraisal review, negotiations, relocation assistance, and advisory services and parcel closings, to include an attorney's final certification of title. The Developer's lead ROW acquisition consultant shall be a member of the Department's pre-qualified ROW contracting consultants (listed on the Department's website) and the Developer's ROW team shall include the Department pre-qualified appraisers and review appraisers (also listed on the Department's website).
- D. The Developer's ROW manager shall:
 - 1. Possess five (5) years of experience in the coordination of right-of-way acquisition and relocation activities; and
 - 2. Have a demonstrated ability to perform or subcontract appraisal, acquisition, and relocation functions in compliance with current VDOT policies and procedures and U.S. Department of Transportation and FHWA regulations and policies.
- E. The Department shall approve appraisals, just compensation, relocation benefits, and settlements prior to any offers.
- F. In accordance with the Agreement, the Developer shall not commence construction of the Project Assets until the Department has delivered the Construction Notice to Proceed following the Developer has satisfied the

conditions, including a Developer certification that all property rights necessary for the commencement of construction have been obtained.

- G. The Developer shall certify to the Department, through submission of the RW300/301 checklist prior to commencing Right-of-Way Acquisition, that all total and partial takes have been identified. Any revisions to the Project's acquisition of fee ROW or permanent, temporary, and utility easements subsequent to the RW300/301 certification shall be submitted to the Department. Upon approval of the Developer's Certification, the Department will issue a Notice to Commence Acquisition to the Developer.
- H. The Developer shall acquire property in accordance with all federal and state laws and regulations, including but not limited to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (the Uniform Act) and Titles 25.1 and 33.2 of the 1950 Code of Virginia, as amended. The text of Title 33.2 may be found at this URL: <http://law.lis.virginia.gov/vacode/title33.2/>.
- I. The acquisition of property shall follow the guidelines as established by the Department and other state and federal guidelines that are required and the VDOT Right of Way Manual of Instructions and the VDOT Utility Manual of Instructions, as well as IIM-LD-243 and Chapter 12 of the VDOT Survey Manual. All conveyance documents for the acquisition of any property interest shall be accompanied by properly marked plan sheets and profile sheets.
- J. The Developer may not employ the use of Rights of Entry until the property owner has been made a legitimate offer to acquire the property.
- K. If the Developer or the ROW subconsultant does not follow the Uniform Act and its implementing regulations found in 49 CFR Part 24 in the performance of the acquisition or relocation processes, or fails to obtain or create any mandatory written documentation in their ROW parcel file, the Developer shall be responsible for any and all expenses determined to be ineligible for reimbursement of federal funding.
- L. ROW Relocations:
 - 1. The Department will designate a hearing officer to hear any relocation assistance appeals. The Department agrees to assist with any out of state relocation by persons displaced within the rights of way by arranging with such other state(s) for verification of the relocation assistance claim.
 - 2. The Developer may entertain the use of relocation incentive payments. Any relocation incentive payments shall be uniformly administered so that all landowners and displacees of a similar occupancy receive fair and equitable treatment. Under no circumstances is a relocation incentive to be used without the Department's prior approval.

3. The Developer may entertain the use of protective leasing to ensure the availability of housing or apartments for relocation purposes.
- M. Section 33.2-1032 of the Code of Virginia, 1950, as amended, provides that the Commissioner of Highways may acquire lands on which graves are located through either voluntary conveyance or condemnation. In the course of relocating such graves, the Commissioner of Highways, through the Office of the Attorney General, will appoint an attorney to prepare the Order and Petition for the exhumation and re-interment of the graves. The Developer shall be responsible for verifying the number of graves, locating next of kin if possible, acquiring new grave sites, and managing the grave relocations as outlined in Chapter 3.4.7 of the Right of Way Manual of Instructions, latest revision.
- N. The Developer shall have a Department approved Project-specific Acquisition and Relocation Plan prior to commencing ROW activities. The Acquisition and Relocation Plan shall describe the Offeror's methods, including the appropriate steps and workflow required for title examinations, appraisals, review of appraisals, negotiations, acquisition, and relocation, and shall contain the proposed schedule of ROW activities, including the specific parcels to be acquired and all relocations. The plan shall allow for the orderly relocation of displaced persons based on time frames not less than those provided by the Uniform Act. This plan shall be updated and resubmitted for Department review and approval as necessary during the life of the Project.
- O. The Department will make decisions concerning the review and approval of just compensation, approval of relocation benefits, approval of administrative settlements and approval of closing or condemnation packages on behalf of the Department. This commitment is based on the plan providing a reasonable and orderly workflow and the work being provided to the Department as complete. Submission of documents requiring the Department approval shall contain the necessary language and certifications as shown on the examples provided in the Appendix to Chapter 10, Special Projects, of the Right of Way Manual.
- P. The Developer shall obtain access to and use the Department's Right of Way and Utilities Management System (RUMS) to manage and track the acquisition process. RUMS will be used for Project status reporting; therefore, entries in RUMS shall be made at least weekly to accurately reflect current Project status. The Department standard forms and documents, as found in RUMS, will be used to the extent possible. Training in the use of RUMS and technical assistance will be provided by the Department.
- Q. The Developer shall provide a current title examination (no older than sixty (60) days) for each parcel at the time of the initial offer to the landowner. Each title examination report shall be prepared by a Department approved attorney or title company. If any title examination report has an effective date that is older than sixty (60) days, an update is required prior to making an initial offer to the

landowner. A title insurance policy in favor of the Commonwealth of Virginia in form and substance satisfactory to the Department shall be provided by the Developer, for every parcel acquired by voluntary conveyance.

- R. The Developer shall document a scope of work detailing the type of appraisal to be prepared for each parcel and the name of the proposed appraiser. The proposed appraiser shall be of an appropriate qualification level to match the complexity of the appraisal scope. The Developer shall prepare appraisals in accordance with the Department's Appraisal Guidelines. The review appraiser shall be on the Department's approved fee review appraiser list. Alternatively the Developer may use a review appraiser who is not on the Department's approved review appraisal list meeting the qualifications and experience consistent with approved personnel.
- S. The Developer shall prepare, obtain execution of, and record documents conveying title to such properties to the Commonwealth of Virginia and deliver all executed and recorded general warranty deeds to the Department. Prior to the recordation of any instrument, the Department will review and approve the document. For all property purchased in conjunction with the Project, title will be acquired in fee simple (except that the Department may, in its sole discretion, direct the acquisition of a ROW easement with respect to any portion of the ROW) and shall be conveyed to the "Commonwealth of Virginia, Grantee" by a Department-approved general warranty deed, free and clear of all liens and encumbrances, except encumbrances expressly permitted by the Department in writing in advance of deed recordation. All easements, except for private utility company easements shall be acquired in the name of "Commonwealth of Virginia, Grantee." Private utility company easements will be acquired in the name of each utility company when the private utility company has prior recorded easements.
- T. The Developer shall be responsible for all contact with landowners for ROW or construction items.
- U. The Developer shall be responsible for all contact with the displaced for relocation assistance.
- V. The Developer shall maintain access at all times to properties during construction.
- W. The Developer shall use reasonable care in determining whether there is reason to believe that property to be acquired for ROW may contain concealed or hidden wastes or other materials or hazards requiring remedial action or treatment. When there is reason to believe that such materials may be present, the Developer shall notify the Department within three (3) days. The Developer shall not proceed with acquiring such property until written notification is received from the Department.

- X. During the acquisition process and for a period of three (3) years from either (1) the date each owner of a property and each person displaced from the property receives the final payment, or (2) from the date the state receives federal reimbursement of the final payment made to each owner of a property and to each person displaced from a property, whichever is later, and until the Commonwealth of Virginia has indefeasible title to the property, all Project documents and records not previously delivered to the Department, including but not limited to design and engineering costs, construction costs, costs of acquisition of rights of way, and all documents and records necessary to determine compliance with the laws relating to the acquisition of rights of way and the costs of relocation of utilities, shall be maintained and made available to the Department for inspection and audit. This also would apply to the FHWA on projects with federal funding. Throughout the design, acquisition, and construction phases of the Project, copies of all documents and correspondence shall be submitted to both the Central Office and the respective Regional Right of Way Office.
- Y. Prior to Project Completion, the Developer shall provide and set the Department RM-2 ROW monuments within the Project limits.
- Z. Any existing ROW fencing impacted by the Developer's design and construction activities shall be restored or replaced in the same configuration relative to the improvements as the existing fencing, unless otherwise approved by the Department. Any new fencing shall be in accordance with Section 3.9.
- AA. The Developer shall notify the Department of any and all encroachments (temporary or permanent) within the ROW prior to Project Completion.
- BB. The Developer shall abide with all federal, state, and local regulations that apply to relocating WMATA traction power substations, tie-breaker stations, transit power and communications systems, pedestrian bridges, access roads, parking, or any additional WMATA facilities impacted by the Project Work. This includes, but is not limited to, all applicable Commonwealth of Virginia regulations and Fairfax County Special Exception/2232 local land use approvals as required.

1.6.2 Condemnation

The Department will make the determination in each case as to whether settlement is appropriate or whether the filing of an eminent domain action is necessary, taking into consideration the recommendations of the Developer. When the Department authorizes the filing of a certificate, the Developer shall prepare a Notice of Filing of Certificate and the certificate assembly. All required documents necessary to file a certificate shall be forwarded along with a prepared certificate to the Department. The Department will execute the certificate and return the assembly to the

Developer. The Developer shall update the title examination and shall file the certificate.

When the Department determines that it is appropriate, the Developer shall be responsible for continuing further negotiations for a maximum of sixty (60) days after a certificate is filed, in order to reach settlement after the filing of certificate. After that time the case will be assigned to an outside attorney appointed by the Department and the Office of the Attorney General. When requested, the Developer shall provide the necessary staff and resources to work with the Department and its attorney throughout the entire condemnation process until the property is acquired by entry of a final non-appealable order, by deed, or by an Agreement After Certificate executed and approved by the Department and the appropriate court. The Developer will provide updated appraisals (i.e., appraisal reports effective as of the date of taking) and expert testimony supporting condemnation proceedings upon request by the Department.

1.7 Utilities

1.7.1 General Requirements

- A. This is a Department sanctioned project and the Developer shall enjoy all of the benefits and responsibilities of the Department as it pertains to prior rights, statutory rights, or any other right relating to utility relocations, subject to the Department's ability to assign those rights.
- B. The Developer shall submit for review and approval by the Department a Utility Plan that details the schedule and proposed activities of the Developer and the utility owners during the Construction Period to the level of detail and extent to which such information is known at the time of submission. Such information will be updated periodically as additional information becomes available during later stages of design. The Utility Plan shall include, but is not limited to, assertions to the following:
 - 1. Durations and schedules for planned utility relocations have been coordinated with utility owners.
 - 2. Durations for utility relocations by utility owners are adequate for the type and scope of services being provided.
- C. The coordination, design, and relocation of all utilities shall comply with these Technical Requirements and the standards and specifications set forth in Attachment 1.5. Additional Work required because of changes in utility owners' requirements shall be at the Developer's risk. It is the Developer's responsibility to verify whether other utility owners exist within the Project limits and coordinate with them.

- D. The Developer shall be responsible for coordinating the Project construction with all utilities that may be affected (including the Department's communications, power cables, and conduits). The Developer shall be responsible for coordinating the work of its Contractors, subcontractors, and the various utilities. The resolution of any conflicts between utility owners and construction of the Project shall be the responsibility of the Developer. No additional compensation or time will be granted for any delays, inconveniences, or damage sustained by the Developer or its subcontractors because of interference from utilities or the operation of relocating utilities.
- E. If the Developer desires the temporary or permanent adjustment of utilities for its own benefit, it shall conduct all negotiations with the utility owners and pay all costs in connection with the adjustment.
- F. At a minimum, the Developer shall be responsible for utility designations, utility locates (test holes), conflict evaluations, cost responsibility determinations, utility relocation designs, utility relocations and adjustments, utility reimbursement, determination of existing utility easements and the inclusion of such easements on plans, replacement land rights acquisition, and utility coordination required for the Project. The Developer is responsible for coordinating all necessary utility relocations and adjustments. All efforts and cost necessary for utility designations, utility locates (test holes), conflict evaluations, cost responsibility determination, utility relocation and utility bridge attachment designs, utility relocations and adjustments, utility reimbursements, replacement land rights acquisition, and utility coordination shall be included in the Developer's cost.
- G. All costs for utility relocations, excluding betterments, shall be included in the Developers price proposal. Utility betterments shall not be included in the price proposal but shall be reimbursed to the Developer through agreement with the requesting utility owner. Betterments must be requested by and approved by the affected utility owner and must meet Buy America requirements.
- H. The compensation paid to landowners for replacement land rights shall be included in the Developer's cost in accordance with the Agreement.
- I. The Developer shall submit a Utilities Plan for the Department to review and approve in accordance with the Agreement. The Developer shall also submit a plan view of the initial utility designation survey. The utilities plan view shall be clear and legible, and details shall be drawn to scale. The Developer shall develop and maintain a utility tracking report as part of the Utilities Plan.
- J. The Developer shall initiate early coordination with all utilities located within the Project limits. The Developer shall identify and acquire any replacement utility easements or required ROW needs of all utilities necessary for relocation

because of conflicts with the Project. The Developer shall coordinate with the utility owners to obtain temporary construction easements or agreements.

- K. The Developer shall provide all utilities with roadway and bridge 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 will use the Developer's design plan for preparing relocation plans and estimates. If a party other than the utility prepares relocation plans, the plans shall include a concurrence box where the utility signs and accepts the relocation plans as shown.
- L. The Developer shall coordinate and conduct a preliminary review meeting with all affected utilities to assess and explain the impact of the Project.
- M. The Developer shall schedule and conduct a utility field inspection for each project segment in accordance with the procedures set forth in the Department's Utilities Manual. The Developer will provide meeting minutes for each utility field inspection.
- N. The Developer shall verify the prior rights of each utility's facilities if claimed by a utility owner. If a dispute occurs over prior rights with a utility, the Developer shall be responsible for resolving the dispute. **The Developer shall prepare and submit to the Department a preliminary utility status report within sixty (60) days of issuance of Limited Notice to Proceed** that includes a listing of all known utilities located within the Project limits and a conflict evaluation and cost responsibility determination for each utility. This report shall include copies of easements, plans, or other supporting documentation that substantiates any compensable rights of the utilities. The Developer shall obtain the following from each utility that is located within the Project limits:
 - 1. Relocation plans, including a letter of "no cost" where the utility does not have a compensable right;
 - 2. Utility agreements, including cost estimate and relocation plans where the utility has a compensable right;
 - 3. Utility easement forms to be executed by the landowner, if necessary;
 - 4. Letters of "no conflict" where the utility's facilities will not be impacted by the Project; and
 - 5. Bridge attachment agreements between the Department and the utility owner, if necessary.
- O. The Developer will use a two-party agreement, similar to the Master Utility Agreement (MUA) used by the Department (provided for in the Department's Utility Manual), to establish the general framework for addressing the utility

issues within the Project affecting a utility owner. The two-party agreement between the Developer and the utility company will set forth the terms and conditions under which the utility work will be performed, and will adhere to the Department's Utility Manual. Included in the two-party agreement will be the statement (with reference to the Agreement) that this work is being performed as a Department project. Preparing all agreements relative to the utility relocation is to be between the Developer and the utility. This includes the agreements for authorization to relocate facilities as well as any reimbursement terms and agreements.

- P. The Developer shall review all relocation plans to ensure that relocations comply with the Department's Utilities Manual and the Department's Land Use Permit Regulations. The Developer shall also ensure that no conflicts exist with the proposed roadway improvements, and that no conflicts exist between each of the utility's relocation plans. The Developer shall prepare and submit to the Department all relocation plans. The Developer is expected to assemble the information included in the relocation plans in a final and complete format and in such a manner that the Department may approve the submittals with minimal review. The Developer is expected to meet with the Department 45 days prior to the first utility submittal to gain a full understanding of what is required with each submittal. The Developer shall receive written approvals from the Department prior to authorizing utilities to commence relocation construction. The utilities shall not begin their relocation work until authorized by the Developer. Each relocation plan submitted must be accompanied by a certification from the Developer stating that the proposed relocation will not conflict with the proposed roadway improvement and will not conflict with another utility's relocation plan.
- Q. The Department will provide reasonable assistance in negotiations with utility owners and will provide available Department documents concerning prior rights in a timely manner as requested by the Developer, but the Department shall incur no liability in providing such reasonable assistance and shall not be required to initiate or participate in any legal action other than as a witness or to produce documents.
- R. The Developer shall design the Project to avoid conflicts with utilities and minimize impacts where conflicts cannot be avoided. The Developer shall be responsible for ensuring that utility service interruptions are minimized.
- S. The utility attachments on bridges shall not be permitted unless approved by the Department.
- T. Where possible, utility manholes should be located outside of any pedestrian areas (sidewalks, paths, etc.). Where manholes are located within a sidewalk or shared use path, the manhole covers must be ADA compliant.

- U. The Developer shall be required to obtain a Department Land Use Permit for installation of any Asset outside the footprint of the Express Lanes and on Project ROW including median areas. These assets include but are not limited to generator sites, electrical service panels, and other Traffic Management System equipment. The Developer shall be required to follow the VDOT Land Use Permit process. The Developer shall be required to submit as-built documentation of these assets as part of the permit process.
- V. The Developer shall ensure the utility owners submit as-built drawings and Land Use Permit applications upon completion of its relocation and (or) adjustments. The Department will issue an as-built permit to the utility owners within twenty-one (21) days of receipt of as-built drawings and Land Use Permit applications.
- W. The Developer shall be responsible for ensuring the appropriate abandonment or removal of all abandoned utilities within the Project ROW.
- X. At the time that the Developer notifies the Department that the Developer deems the Project to have reached Project Completion, the Developer shall certify to the Department that all utilities have been identified and conflicts have been resolved and that those utilities with compensable rights or other claims related to relocation or coordination with the Project have been relocated and their claims and compensable rights satisfied or will be satisfied by the Developer.
- Y. The Developer shall accurately show the final location of all utilities on the as-built drawings for the Project. The Developer will ensure the utility companies submit as-built drawings upon completion of their relocation or adjustments. The Department will issue an as-built permit to the utility companies after receipt of permit application and as-built drawings. The Developer shall be responsible for closing all utility permits and resolving all utility conflicts prior to Project Completion.

1.7.2 Developer's Responsibility for Utility Property and Services

- A. At points where the Developer's operations are on or adjacent to the properties of any utility, including railroads, and damage to which might result in expense, loss, or inconvenience, work shall not commence until arrangements necessary for the protection thereof have been completed. The Developer shall cooperate with utility owners so that:
 - 1. Removal and adjustment operations may progress in a timely, responsible, and reasonable manner; and
 - 2. Duplication of adjustment work may be reduced to a minimum, and services rendered by those parties will not be unnecessarily interrupted.

- B. If any utility service is interrupted as a result of accidental breakage or of being exposed or unsupported, the Developer shall promptly notify the proper authority and shall cooperate fully with the authority in the restoration of service. If utility service is interrupted, repair shall be continuous until service is restored.
- C. The Department's Traffic Management System (TMS) fiber optic communication lines and associated electrical distribution lines are located throughout the project limits in conjunction with other public utilities. The TMS utilities will not be located by Miss Utility. **The Developer is responsible for all field markings of all Department-owned utilities pursuant to the Agreement.** The Developer shall exercise care to prevent damage or disruption to the TMS. However, in the event the Developer or its contractor(s) damage the TMS during operations, the Developer shall promptly notify the McConnell Public Safety and Transportation Operations Center (MPSTOC) as well as the Department project manager. Except as set forth in the Agreement, the Developer shall be responsible for all cost necessary for repair and time impact to the project. Additionally, the Department has an agreement with the U.S. Army Corps of Engineers (USACE) and WMATA to share capacity in a duct bank that also contains the Department cable. The USACE cable is in orange and orange with white stripe HDPE ducts. If damage occurs to USACE cables, the Developer shall promptly notify the USACE and the MPSTOC.
- D. The Developer shall comply with all requirements of the Virginia Underground Utility Damage Prevention Act (the Miss Utility law).
- E. The Department's facilities, including roadway lighting cable and conduit, traffic management systems cable and conduit, and Department-owned fiber optic lines, are not marked by the Miss Utility. Therefore, the Developer may either elect to use at its own discretion and cost the Department on-call consultant or alternatively use a competent contractor or consultant familiar with the Department-owned utilities. Moreover, the Department will, if available, furnish the Developer with a set of as-built plans for such markings. It is the Developer's sole responsibility to have these utilities marked, maintain the markings throughout the life of the Project, and assume physical and financial arrangements to have these utilities marked and re-marked. The Developer will be responsible for all cost necessary for these utility markings.
- F. The Developer shall determine whether other utilities are present in addition to those identified by the Utility Field Inspection and shall afford those additional utilities an equivalent notification protocol.

1.7.3 Restoration of Work Performed by Others

- A. The Department may construct or reconstruct any utilities within the limits of the Project or grant a permit for the same at any time.

- B. Subject to authorization by the Department, the Developer shall allow any person, firm, or corporation to make an opening in the highway within the limits of the Project upon presentation of a duly executed permit from the Department or any municipality for sections within its corporate limits.

1.8 Work Restrictions

1.8.1 General Requirements

- A. The Developer shall be responsible for a Maintenance of Traffic Plan (MOT) in accordance with Instructional and Information Memorandum IIM-LD-241 (Work Zone Safety and Mobility) and TE 351 on Work Zone Speed Analysis, which shall include but not be limited to the following:
 - 1. The Developer's MOT plans development shall be consistent with the Agreement, including these Technical Requirements.
 - 2. The Developer shall comply with pertinent requirements for maintenance of traffic for the Work. The Developer is responsible for the safety of the work zone. The Developer shall appoint a single point of contact to address MOT and safety requirements for the work zone.
 - 3. The Developer shall conduct all work necessary to provide safe and efficient MOT during construction, including provisions for the movement of people, goods, and services through and around the Project while minimizing impacts to pedestrians, bicyclists, local residents, businesses, and commuters. In no event shall sidewalks or shared use paths be closed unless first approved by the Department, considering planned and designed alternative facilities by the Developer.
 - 4. The Developer shall coordinate activities including but not limited to communications, public outreach, and stakeholder engagement; lane closures; and MOT and Traffic Control Plan (TCP) implementation with the Department-administered Transportation Management Plan (TMP) program.
 - 5. The Developer shall maintain four (4) lanes of traffic on I-66 in the peak direction during the Peak Period.
- B. The Department will provide and administer a TMP that will include the Developer's MOT plans on the Project. The Department's TMP will include strategies for:
 - 1. Traffic operations;
 - 2. Local network operations;

3. Transit/Travel Demand Management (TDM);
4. Communications and outreach;
5. Additional Virginia State Police and Safety Service Patrol; and
6. Other strategies to maintain mobility and safety in the work zone.

1.8.2 Work Hours

- A. The Developer is advised that its general operations may proceed seven days a week, 24 hours a day, during the Construction Period, except as may be modified herein.
- B. This is contingent upon the Developer obtaining a variance or waiver of all applicable noise restrictions, as stated in the Agreement.

1.8.3 Temporary Roadway Closures

- A. Lane and Shoulder Closures

To facilitate construction and minimize inconvenience to the public, the Developer is advised of, and shall comply with, the closure limitations listed in Table 1.8a. The Department reserves the right to modify the closure limitations in Table 1.8a, and any modification shall be handled under the Allowance for Additional Lane Closure Restriction by the Department or Developer Request for Additional Lane Closures.

There shall be no lane closures allowed during construction at Bull Run Drive Bridge beyond those allowed in Table 1.8a.

The Department may allow long-term lane closures during construction that cannot exceed six (6) months in duration at the following locations:

1. Waples Mill Road - The Department will allow the existing two lane bridge to be reduced to a single 11 foot lane using temporary signalization. Pedestrian access shall be maintained during construction.
2. Vaden Drive – The Department will allow the existing four lane bridge to be reduced to two 11 foot lanes with one lane in each direction. Pedestrian access shall be maintained during construction.

- B. The Developer shall provide the Department at the designated location with a weekly work zone plan of all closures on the Wednesday prior to the next week's planned work activity.
- C. The lane closure approval and coordination process shall conform to the requirements of the Agreement.

Table 1.8a: Allowable Hours for Roadway Lane and Shoulder Closures

INTERSTATE 66					
WEEKDAY		Eastbound			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Three-Lane (or more) Closures	Complete Road Closure (a)
Segment 1	West of US 15	10:00 AM to 3:30 PM	N/A	N/A	12:00 AM to 4:00 AM
		8:00 PM to 5:00 AM			
Segment 2	US 15 to Route 286	10:00 AM to 3:30 PM	9:00 PM to 5:00 AM	10:00 PM to 5:00 AM	12:00 AM to 4:00 AM
		8:00 PM to 5:00 AM			
Segment 3	Route 286 to US 50	11:00 AM to 3:30 PM	10:00 PM to 5:00 AM	11:00 PM to 5:00 AM	12:00 AM to 4:00 AM
		9:00 PM to 5:00 AM			
Segment 4	US 50 to East of Beltway (b)	11:00 AM to 3:30 PM (e)	10:00 PM to 5:00 AM**	11:00 PM to 5:00 AM**	12:00 AM to 4:00 AM
		9:00 PM to 5:00 AM			
Segment 5	Beltway to TR Bridge (Inside Beltway)	9:30 PM to 5:00 AM	N/A	N/A	12:00 AM to 4:00 AM
All lanes open at 12:00 noon on Friday					
WEEKDAY		Westbound			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Three-Lane (or more) Closures	Complete Road Closure (a)
Segment 1	West of US 15	8:00 AM to 2:30 PM	N/A	N/A	12:00 AM to 4:00 AM
		9:00 PM to 6:00 AM			
Segment 2	US 15 to Route 286	9:00 AM to 2:30 PM	9:30 PM to 6:00 AM	10:30 PM to 5:00 AM	12:00 AM to 4:00 AM
		9:00 PM to 6:00 AM			
Segment 3	Route 286 to US 50	9:00 AM to 2:00 PM	10:00 PM to 5:00 AM	11:00 PM to 5:00 AM	12:00 AM to 4:00 AM
		9:30 PM to 5:00 AM			
Segment 4	US 50 to East of Beltway (b)	9:00 AM to 2:00 PM (e)	10:00 PM to 5:00 AM**	11:00 PM to 5:00 AM**	12:00 AM to 4:00 AM
		9:30 PM to 5:00 AM			
Segment 5	Beltway to TR Bridge (Inside Beltway)	9:30 AM to 2:00 PM*	10:00 PM to 5:00 AM	N/A	12:00 AM to 4:00 AM
		10:00 PM to 5:00 AM			
All lanes open at 12:00 noon on Friday					
* Only to be considered for three lane segment					
** Consider opening shoulder lane, where Applicable to maintain three lanes					

INTERSTATE 66			
WEEKEND	Eastbound/Westbound		
Outside Beltway	Single-Lane Closures or Shoulder	Multiple-Lane Closures	Complete Road Closure (a)
Friday to Saturday	9:00 PM to 9:00 AM	10:00 PM to 6:00 AM	12:00 AM to 5:00 AM
Saturday to Sunday	9:00 PM to 9:00 AM	10:00 PM to 6:00 AM	12:00 AM to 5:00 AM
Sunday to Monday	8:00 PM to 5:00 AM	9:00 PM to 4:00 AM	12:00 AM to 4:00 AM
Inside Beltway	Single-Lane Closures or Shoulder	Multiple-Lane Closures	Complete Road Closure (a)
Friday to Saturday	10:00 PM to 6:00 AM	N/A	12:00 AM to 5:00 AM
Saturday to Sunday	10:00 PM to 6:00 AM	N/A	12:00 AM to 5:00 AM
Sunday to Monday	9:30 PM to 5:00 AM	N/A	12:00 AM to 4:00 AM

ARTERIAL Single-Lane Closures^(f) or Shoulder					
ARTERIAL	WEEKDAY		WEEKEND		
	Monday to Thursday	Friday	Friday to Saturday	Saturday to Sunday	Sunday to Monday
Limited Access Highway (c)	10:00 AM to 3:00 PM	9:30 AM to 12 Noon	10:00 PM to 8:00 AM	10:00 PM to 8:00 AM	10:00 PM to 5:00 AM
	9:00 PM to 5:00 AM				
Major Arterials (d)	9:30 AM to 3:00 PM	9:30 AM to 2:00 PM	10:00 PM to 8:00 AM	10:00 PM to 8:00 AM	10:00 PM to 5:00 AM
	9:00 PM to 5:00 AM				
All Other Roadways	9:00 AM to 3:30 PM	9:00 AM to 2:00 PM	10:00 PM to 8:00 AM	9:00 PM to 8:00 AM	10:00 PM to 5:00 AM
	9:00 PM to 5:00 AM				

ARTERIAL Multiple-Lane Closures					
ARTERIAL	WEEKDAY		WEEKEND		
	Monday to Thursday	Friday	Friday to Saturday	Saturday to Sunday	Sunday to Monday
Limited Access Highway (c)	9:00 PM to 5:00 AM	Not allowed until 11:00 PM	11:00 PM to 6:00 AM	11:00 PM to 6:00 AM	11:00 PM to 5:00 AM
Major Arterials (d)	9:00 PM to 5:00 AM	Not allowed until 11:00 PM	11:00 PM to 6:00 AM	11:00 PM to 6:00 AM	11:00 PM to 5:00 AM
All Other Roadways	9:00 PM to 5:00 AM	Not allowed until 10:00 PM	10:00 PM to 6:00 AM	10:00 PM to 6:00 AM	10:00 PM to 5:00 AM

INTERSTATE 495 (BELTWAY)					
WEEKDAY		Inner/Outer Loop			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Three-Lane (or more) Closures	Complete Road Closure
Segment 1	A. L. Bridge to Springfield Interchange	10:00 AM to 3:00 PM	10:00 PM to 5:00 AM	11:00 PM to 5:00 AM	12:00 AM to 4:00 AM
		9:30 PM to 5:00 AM			
Segment 2	Springfield Interchange to W.W. Bridge	10:00 AM to 3:00 PM	10:00 PM to 5:00 AM	11:00 PM to 5:00 AM	12:00 AM to 4:00 AM
		9:30 PM to 5:00 AM			
All lanes open at 12:00 noon on Friday					
WEEKEND		Inner/Outer Loop			
		Single-Lane Closures or Shoulder	Multiple-Lane Closures	Complete Road Closure	
Friday to Saturday		10:00 PM to 8:00 AM	11:00 PM to 6:00 AM	12:00 AM to 5:00 AM	
Saturday to Sunday		10:00 PM to 8:00 AM	11:00 PM to 6:00 AM	12:00 AM to 5:00 AM	
Sunday to Monday		9:30 PM to 5:00 AM	11:00 PM to 5:00 AM	12:00 AM to 4:00 AM	

	EXPRESS LANES	
	Single-Lane Closures or Shoulder	Complete Road Closure***
WEEKDAY	9:30 PM (Sunday to Thursday) to 4:00 AM (Monday to Friday)	11:00PM to 4:00AM
WEEKEND	11:00 PM (Friday to Saturday) to 9:00 AM (Saturday to Sunday)	11:00PM to 4:00AM

*** Complete Road Closure on Express Lanes for 30 minutes or less

- (a) Complete Road Closures: 20 minutes maximum or a time frame approved by the Department to facilitate the lifting and placing of bridge beams, demolition and removal of bridge elements, and erection or removal of overhead sign panels and other structures.
- (b) Multiple lane closures shall use the Auxiliary travel (shoulder) Lane, as approved by the Department, per the lane closure approval process. The Auxiliary travel (shoulder) Lane shall be treated as a travel lane all day.
- (c) Limited Access Highways are defined as high speed high volume roadways with limited access, such as Rt. 234 Bypass, Rt. 286, and Rt. 28.
- (d) Major Arterials are defined as Primary Roads, high volume Secondary Roads, and all other routes that connect directly to Interstates, such as US.15, US.29, US 50, Rt.123, Rt.234, Rt. 243, Gallows Road, and Stringfellow Road.
- (e) The Developers must maintain three lanes of traffic during daytime hours as permitted per Table 1.8a.
- (f) Single-lane closures are only permitted for multiple-lane roadways.

Long-term closures of the shoulders adjacent to the general purpose lanes are allowable pursuant to the Agreement. Some roadway closures will require coordination and permit with the agency having jurisdiction over the roadway.

D. Temporary Roadway Closures in the Reversible HOV Ramps

1. The existing reversible high-occupancy vehicle (HOV) ramp hours of operations (set forth in Table 1.8b) shall remain in place during the Construction Period, unless otherwise specified by the Department with advance notice to the Developer. During the Construction Period, the Department will be responsible for the operation of the existing reversible ramps, including gate operations and reversal of the flow of traffic.
2. The complete closure of the reversible ramps at Stringfellow Road and Monument Drive shall not be permitted within the project limits during the Construction Period, unless approved by the Department in advance with proper TMP efforts. These adjustments shall be handled under the Allowance for Additional Lane Closure Restriction by the Department or Developer Request for Additional Lane Closures.

Table 1.8b Reversible Ramp Hours of Operations at Stringfellow Road and Monument Drive	
Monday – Thursday and Friday (until 7:00 p.m.)	
7:00 PM – 5:00 AM	Open to all Traffic – Westbound
5:30 AM – 9:30 AM	Open to HOV-2 Only – Eastbound
10:00 AM – 3:00 PM	Open to all Traffic – Westbound
3:00 PM – 7:00 PM	Open to HOV-2 Only – Westbound
Friday Evening – Saturday – Sunday	
7:00 PM Fri – 5:00 AM Mon	Open to all Traffic – Westbound

All gate operations and reversal of traffic must occur within permitted closure periods only. The start of the gate operation to open the ramps must begin by 4:30 a.m. If the facility is not cleared to be open to traffic by 4:30 a.m., unless approved by the Department, all associated Lane Closure Liquidated Damages will be assessed beginning at 5:01 a.m. as stipulated in the Agreement.

E. Lane Closure Types

Type 1 – A lane closure resulting in a significant impact on traffic, such as stopping traffic completely, closing two or more lanes, closing an exit or entrance ramp at freeway interchanges, or changing traffic patterns. This type of closure would require extensive media and stakeholder notification and coordination among various local and state agencies, as identified in the Public Information and Communications Plan.

Type 2 – A lane closure resulting in minor or no impact on the flow of traffic, such as closing one lane on a 4-lane roadway during off-peak traffic hours.

Type 3 – A lane closure that would close a shoulder (right or left) on a roadway or ramp.

Table 1.8c lists the advance notices required for each type of lane and shoulder closures.

Table 1.8c Roadway Lane and Shoulder Closures		
Type	Minimum Advance Notice (days)	Maximum Advance Notice (days)
1	10	21
2	5	14
3	3	14

- F. The Baseline Schedule shall identify construction phases. The schedule will be reviewed in detail to assure that the scheduling meets the objectives for expediting the Project and minimizing traffic disruptions.
- G. Confirmation of approved lane closures shall be made 24 hours before any scheduled lane closure and shall include a written reiteration of the proposed tasks and a listing of materials, labor, and major equipment to be used. Complete road closures require a 72-hour advance confirmation for coordination. The Developer is responsible for providing adequate advance notification via variable message and required static signing for lane closures in accordance with the Virginia Work Area Protection Manual (VWAPM) and the Manual on Uniform Traffic Control Devices (MUTCD). Once a closing is in place, work shall begin immediately and shall progress on a continuous basis to completion or to a designated time.
- H. Traffic backups must dissipate before successive closings can be implemented.
- I. The minimum clear distance between two separate lane closings (i.e., from the last traffic cone of the first closing to the first cone of the second closing in the same roadway) shall be two miles.
- J. A meeting shall be held between the Developer and the Department a minimum of 4 weeks prior to the erection of any portion of the structural steel or concrete girder bridges that will require complete lane closures or detour. The Developer, the fabricator, the shipper, the erector, and the Developer’s safety representative shall attend this meeting. Representatives of the Department project manager and Virginia public agencies who will be present include, but are not limited to, the Virginia State Police, Fairfax County Police, and WMATA.

Lane closures, shoulder closures, or work that impacts traffic flow will not be permitted on September 11, Inauguration Day, and holidays as indicated here. For the purposes herein, the term “holiday” shall apply to New Year’s Day, Martin Luther King Jr. Day, President’s Day, Easter, Memorial Day,

Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, and Christmas Day. The Department may adjust lane closure times to accommodate shopping seasons associated with the aforementioned holidays. Additional restrictions for other holidays or special local events may be necessary. These adjustments shall be handled under Allowance for Additional Lane Closure Restriction by the Department and/or the Developer's Request for Additional Lane Closures.

Following are holiday and special event closure times that will NOT be permitted for lane or shoulder closures:

- January 1: From noon on the preceding day until noon on the following day, with the exception of *
- 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: From noon on Friday until noon on Tuesday
- President's Day: From noon on Friday until noon on Tuesday
- Easter: From noon on Friday until 9:30 a.m. Monday
- Memorial Day: From noon on Friday until noon on Tuesday
- July 4 (Independence Day): From noon on the preceding day until noon on the following day, with the exception of *
- Labor Day: From noon on Friday until noon on Tuesday
- September 11: No daytime closures
- Columbus Day: From noon on Friday until noon on Tuesday
- Veteran's Day: From noon on the preceding day until noon on the following day, with the exception of *
- Thanksgiving Day: From noon on the Wednesday preceding Thanksgiving Day until noon on the Monday following Thanksgiving Day
- Christmas Day: From noon on the preceding day until noon on the following day, with the exception of *

* **If the Holiday occurs on a Friday or Saturday:** No daytime closures on the preceding Thursday to noon on the following Monday. **If the Holiday occurs on a Sunday or Monday:** No daytime closures on the preceding Friday to noon on the following Tuesday.

- K. Extension of a lane closure time, except as approved by the Department, is not acceptable and triggers Lane Closure Liquidated Damages in accordance with the Agreement. The Lane Closure Liquidated Damages for failure to restore all lanes to traffic by the designated times as described in the Agreement and shall be assessed starting from the end of the approved time. Restoration of traffic shall mean the completion of all construction work; the removal of all traffic control devices and signs; and removal of all workers, materials, and equipment from the roadway. The charges apply regardless of the day or date.
- L. The Lane Closure Liquidated Damages are set forth in the Agreement. If a Non-Permitted Closure occurs, the Department will notify the Developer thereof and of the amount of associated Lane Closure Liquidated Damages in writing. If there are no additional Non-Permitted Closures occurring within ninety (90) days, the Department will refrain charging of the Lane Closure Liquidated Damages for the prior Non-Permitted Closure. Otherwise, the Developer shall pay all Lane Closure Liquidated Damages to the Department for having two (2) or more Non-Permitted Closure occurrences within ninety (90) days. Once there is a clean period of ninety (90) days without a Non-Permitted Closure occurrence, the new ninety (90) day period will start for future Lane Closure Liquidated Damages.
- M. In addition to the provisions listed in subsections K and L above, if the Developer causes the assessment of Lane Closure Liquidated Damages for failure to restore traffic lanes, and depending upon the severity (15-minute delayed opening or more than two delay incidents in one week) of the closure violations as determined by the Department, the Developer will not be allowed further lane closures until the reasons for the assessment are evaluated and the Developer can provide assurance that the causes have been corrected.
- N. The Department reserves the right to monitor traffic conditions affected by the work and to make additional restrictions as may be necessary, such as terminating a lane closure early. These adjustments shall be handled under the Allowance for Additional Lane Closure Restriction by the Department and/or Developer Request for Additional Lane Closures.

1.8.4 Allowance for Additional Lane Closure Restriction by the Department or Developer Request for Additional Lane Closures

- A. At the Department's reasonable discretion and approval, the Developer 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.
- B. Closures of longer durations than those listed in Table 1.8a will require a review of plans, implementation of detours, and public outreach.

C. The Department reserves the right to monitor traffic conditions affected by the work and to make additional restrictions as may be necessary, such as terminating a lane closure early.

D. General Requirements

1. The Department will track any additional lane closure time granted outside of time allowed in the Agreement.
2. Any additional time granted must comply with all the requirements set forth in the Agreement.
3. Developer acknowledges that instances will arise where the Developer may not be allowed to implement an approved lane closure during events that are beyond the Department's control.
4. The Developer shall be cognizant of and compliant to traffic demands during special events. Construction activities 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:
 - 4.1 Presidential motorcades traveling through project limits;
 - 4.2 Special events with regional impacts;
 - 4.3 Special sport events with regional impacts;
 - 4.4 Major accidents and incidents with regional impacts;
 - 4.5 Holiday or seasonal traffic patterns;
 - 4.6 Natural or other disasters requiring regional evacuations; and
 - 4.7 Any time restrictions relative to work in or over WMATA facilities.

E. Calculating Hours

1. Additional time (lane closures) – Any additional time requested by the Developer and granted by the Department beyond the approved hours within the Agreement will be added for every instance and every location at 15-minute intervals.
2. Additional Time (complete closures) – If a full closure of roadway not specified in the Agreement is implemented in lieu of a 30-minute total temporary closure, hours will be calculated in the same manner as the hours that were requested and approved for the specific closure.

3. Time Deducted – When the Developer is not allowed to implement a lane closure by the Department during the approved hours within the Agreement, the hours during which such lane closure is not allowed will be deducted from the total hours accumulated.

F. Documentation

1. Within the first sixty (60) days, the Department and Developer will develop and agree on a format of documenting this additional lane closure request information. The form should at least contain date, hours allowed, hours disallowed, impacted time, etc.
2. By the 10th of each month, the Department and Developer will reconsolidate and agree on the resultant amount of hours allowed and disallowed.

G. Allowance

1. At the end of the Project, the Department and the Developer will reconcile the resultant impacted time or additional granted time by subtracting the additional time granted by the Department from the time the Developer was disallowed per the Technical Requirements in accordance with the Agreement to implement the lane closures. The Department and the Developer will endeavor to maintain a neutral balance of resultant impacted and additional granted time throughout the duration of the project.
2. Any lane closures affected by inclement weather, snow and the snow removal process, emergency Department maintenance repair, safety shutdowns, major accidents, and any stoppage by WMATA are not subject to above allowance and are excluded from the calculations and compensations.

H. General

Notwithstanding anything to the contrary, it is agreed that:

1. The Department will provide the Developer with as much notice as is possible with respect to any lane closure request by the Developer that is not approved by the Department.
2. The Developer will provide the Department with as much notice as is possible with respect to any inability of the Developer to implement lane closures that are otherwise allowed within the Agreement.
3. If the Department disapproves requests for lane closures from the Developer, or otherwise prevents the Developer from implementing lane

closures that are otherwise permitted by the Agreement, and the impact of such actions by the Department is more than 180 cumulative hours, such actions shall constitute a Department Change.

1.8.5 Night Work

- A. In areas where Work is to be performed during the hours of dusk or darkness, the Developer shall furnish, place, and maintain lighting facilities capable of providing light of sufficient intensity to facilitate good workmanship and proper inspection at all times. The lights shall be arranged so as not to interfere with or impede traffic approaching the Work site(s) from either direction or produce undue glare to property owners.
- B. Lighting of the Work site(s) may be accomplished using any combination of portable floodlights, standard equipment lights, existing street lights, temporary street lights, etc. that will provide the proper illumination.
- C. The Developer shall furnish and place warning signs to alert approaching motorists of lighted construction area(s). These warning signs shall be 4 feet (1,200 mm) x 4 feet (1,200 mm). The Developer's vehicles used on the Project shall be provided with amber flashing lights that shall be in operation while in the work area. The Developer's equipment shall be provided with a minimum of 3 square feet of reflective sheeting that is visible to approaching motorists. The Developer shall provide its personnel with reflective vests, which shall be worn at all times while the workers are within the Work area. The Developer shall provide a light meter to demonstrate that the minimum light intensity, as specified in Attachment 1.5, is being maintained.
- D. The Developer shall provide sufficient fuel, spare lamps, generator, etc., to maintain the lighting of the Work site. The Developer shall use padding or shielding or locate mechanical and electrical equipment to minimize noise generated by lighting operations as directed by the Department. Noise generated by portable generators shall comply with all applicable laws.
- E. The Developer shall be responsible for coordinating sufficient uniformed law enforcement officers with a law enforcement vehicle equipped with an emergency light for all night time Work that is performed within the travel lanes.

1.8.6 Construction Noise

- A. The Developer's operations shall be performed so that exterior noise levels measured during a noise-sensitive activity shall be not more than 80 decibels. Noise-sensitive activity is any activity for which lowered noise levels are essential if the activity is to serve its intended purpose. Such activities include those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks, and recreational areas.

- B. Developer shall monitor its construction-related noise if requested by local agencies, the Department, or neighboring property owners. If construction noise levels exceed 80 decibels during noise-sensitive activities, the Developer shall take corrective action before proceeding with operations.
- C. The Developer shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to non-compliance with these requirements.
- D. Developer shall determine whether certain portions of the Project that produce objectionable noise should be restricted or prohibited between 10 p.m. and 6 a.m. subject to Department approval. If other hours are established by local ordinance, the local ordinance shall govern.
- E. Equipment shall in no way be altered so as to result in noise levels that are greater than those produced by the original equipment. When feasible, the Developer shall establish haul routes that direct its vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

These requirements are not applicable if the noise produced by sources other than the Developer's operation at the point of reception is greater than the noise from the Developer's operation at the same point.

1.8.7 Law Enforcement Utilization

- A. It is understood by all parties that the Developer will work with and comply with the direction of the Department to determine the use of law enforcement during temporary traffic control operations involving lane closures or rolling lane closures, and any other operation as covered in Appendix C of the Virginia Work Area Protection Manual.
- B. Law enforcement shall not be used in lieu of flag persons.

1.8.8 Use of Explosives

- A. The Developer shall obtain approval from the Department in order to use explosives on the Project. Explosives shall be stored and used in a secure manner in compliance with all federal, state, and local regulations. Prior to prosecuting the Work, the Developer shall conduct an on-site review of the work involved and develop a plan of operations for performing excavating work. Where feasible, the Developer shall explore other means of loosening and or reducing the size of the excavation without blasting. When blasting becomes necessary, the Developer's plan of operations shall include a blasting plan detailing the blasting techniques to be used during excavation operations requiring the use of explosives. Both plans shall be submitted to the Department for review prior to commencing blasting operations.

- B. Explosives shall be purchased, transported, stored, used, and disposed of by a Virginia Certified Blaster in possession of a current criminal history record check and commercial driver's license with hazardous materials endorsement and a valid medical examiner's certificate.
- C. The Developer shall be responsible for damage resulting from the use of explosives. The Developer shall notify each property and utility owner having a building, structure, or other installation above or below ground in proximity to the site of the Work of its intention to use explosives. Notice shall be given sufficiently in advance of the start of blasting operations to enable to owners to take steps to protect their property. The review of the Developer's plan of operations, blasting plan, and notification of property owners shall in no way relieve the Developer of its responsibility for damage resulting from its blasting operations.

1.8.9 Miscellaneous Work Restrictions

- A. George C. Yeonas Park – Town of Vienna – Vienna Little League

The Developer shall not impede the park operations in regards to the use of the baseball fields or other park assets at George C. Yeonas Park from March 1st through November 15th during construction of the Project. The Developer may submit an alternative construction sequencing impact mitigation plan for construction of Project assets that impact the park between these dates if that plan clearly accommodates the public use of the facility, the athletic events, and other important elements of the park operations. The Developer may have to erect safety netting between the fields and I-66 during sound barrier wall construction. This impact mitigation plan shall be reviewed and approved by the Department before commencement of any construction activities.

- B. Mosby Woods Pool – Fairfax

The Developer shall not impede the pool and facility operations at the Mosby Woods Community Pool from May 20th through September 15th during construction of the Project. The Developer may submit an alternative construction sequencing impact mitigation plan for construction of Project assets that impact the pool facility between these dates if that plan clearly accommodates the use of the facility, the pool events, and other important elements of the facility operations. This impact mitigation plan shall be reviewed and approved by the Department before commencement of any construction activities.

- C. Miscellaneous Construction Operations and Coordination – Project Wide

The Developer shall coordinate, accommodate, and shall not impede other community events and facilities similar to the Yeonas Park and Mosby Woods

Pool restrictions in terms of construction operations. These restrictions shall be determined by the Department.

1.9 Maintenance of Traffic

1.9.1 General Requirements

- A. MOT development shall be consistent with the Agreement, including these Technical Requirements.
- B. Work zone information shall be shared with the Department's Northern Region Operations Advanced Traffic Management System (ATMS) and any other regional ATMS and shall be approved by the Department.
- C. The Developer shall provide a primary MOT engineer to perform the following:
 - 1. Coordinate implementation of the TMP as developed by the Department;
 - 2. Oversee the design and implementation of the MOT plans;
 - 3. Coordinate MOT activities with the public and community outreach staff and the Department; and
 - 4. Implement traffic management strategies.
 - 5. The MOT engineer or an approved designee shall be continuously available during construction until Project Completion and elimination of all construction traffic control.
- D. Unless otherwise approved by the Department, the MOT engineer shall be a Professional Traffic Operations Engineer (PTOE) registered in the Commonwealth of Virginia who demonstrates MOT design management and implementation experience of similar project complexity. The MOT engineer shall have completed the training and examination by the Virginia Department of Transportation on the proper practices and methods for the MOT installation, maintenance, and removal of temporary traffic control devices and hold the Verification of Completion of Advanced Work Zone Traffic Control Training certificate in his or her possession.
- E. The Developer shall prepare traffic analyses and modeling for all MOT phases and stages, exclusive of closures identified in the Agreement, in order to identify traffic impacts. The Developer shall use analytical and deterministic (HCM-based) analyses, supplemented with traffic simulation and optimization tools for the analyses. Traffic analyses and modeling shall also be required for all construction activities requiring a detour, requiring closure of multiple lanes, or deviating in any way from what is set forth in the Agreement.

- F. Traffic analyses will vary depending on the magnitude of the closure, detour, or other change. The scope of the traffic analyses and the assumptions to be used will be determined in a meeting held with the Department.
- G. All MOT plans and documents shall have a valid digital Professional Engineering stamp held by the MOT engineer.
- H. All Temporary Traffic Controls shall be shown on AFC Plans.
- I. Only TL-3, Type I Re-Directive Impact Attenuator shall be used on interstates, limited access highways, major arterials, and its associated ramps unless otherwise approved by the Department in its sole discretion. TL-3, Type II Non-Redirective Impact Attenuator may only be used with movable barrier.
- J. All stages and phases of construction, including installation and testing of the Electronic Toll and Traffic Management (ETTM) system, shall be covered by an MOT plan.
- K. If any sidewalk or shared use path is requested to be closed under the requirements of section 1.8.1(A)3 the alternative routes considered shall be covered by an MOT plan.

1.9.2 MOT During Construction

- A. The construction activities will be completed in accordance with the Traffic Management Plan, and with the requirements of the Agreement and the Department's Instructional and Information Memorandum IIM-LD-241 (Work Zone Safety and Mobility) and TE 351 on Work Zone Speed Analysis will be adopted for MOT on the Project. In addition to the requirements of the Developer's approved Traffic Management Plan, the Developer shall provide the following:
 - 1. Portable Changeable Message Signs (6 units) that can be remotely controlled from MPSTOC and shall be placed/relocated by the Developer at mutually agreed locations.
 - 2. Portable Camera Trailers (2 units) that can be remotely controlled from MPSTOC and shall be placed/relocated by the Developer at mutually agreed location.
 - 3. "Truck Entering Highway" warning/queue systems as needed on I-66 for the Developer's construction operations. The Developer shall use a smart work zone system to provide advance warning to roadway users of construction traffic exiting the work zone.
- B. The Developer shall maintain traffic consistent with the agreed upon TMP.

- C. The Developer shall conduct daily and weekly MOT inspection to ensure all traffic devices and traffic patterns are in compliance with the VWAPM and MUTCD standards. A weekly MUTCD report shall be provided to the Department and include the following:
1. Date discrepancy was identified;
 2. Description of discrepancy;
 3. Corrective action required;
 4. Date corrective action should be taken; and
 5. Date corrective action was completed.
- D. The Developer shall develop temporary Traffic Control Plans (TCPs) for each stage of construction including the installation and testing of the ETTM system that shows the Developer's proposed construction staging and proposed traffic control devices consistent with the MOT plan.
- E. The Developer shall be responsible for coordinating a uniformed law enforcement officer with a law enforcement vehicle equipped with an emergency light during set-up and take-down of all daytime intersection closures involving two or more lanes of traffic.
- F. The Developer shall coordinate the location of emergency crossovers with law enforcement and emergency services and shall maintain existing emergency crossover access during construction as coordinated with law enforcement, emergency services, and the Department.
- G. Detour plans shall be developed by the Developer and presented to the Department for approval. The Developer shall coordinate detour plans with local, state, and federal agencies (as applicable) and submit and update the MOT plan thirty (30) days in advance of any planned detour activity. The Developer shall be responsible for all planning, consultation, and coordination with impacted parties, design, implementation and monitoring, and maintenance of detours—whether within or outside the Project ROW. The provision of detours and marking of alternate routes will not relieve the Developer of the responsibility for ensuring the safety of the public or from complying with any requirements of the Agreement.
- H. ROW for temporary highways, diversion channels, sediment and erosion control features, or bridges required by the Technical Requirements will be planned, designed, and provided by the Developer.

- I. During any suspension of Work, the Developer shall temporarily open to traffic such portions of the Project and temporary roadways as may be agreed upon by the Developer and Department.
- J. Unless a Design Exception or Design Waiver is granted, the geometric design for temporary roadways and temporary traffic control shall be designed, at a minimum, to the existing posted speed limit.
- K. Certified flaggers shall be provided in sufficient number and locations as necessary for control and protection of vehicular and pedestrian traffic in accordance with the requirements of the VWAPM. Flaggers shall be able to communicate to the traveling public in English while performing the job duty as a flagger at the flagger station. Flaggers shall use sign paddles to regulate traffic in accordance with the requirements of the VWAPM. Flagger certification cards shall be carried by flaggers while performing flagging duties. Flaggers found not to be in possession of their certification card shall be removed from the flagging site and operations requiring flagging will be suspended by the Department. Further, flaggers performing duties improperly will have their certifications revoked.
- L. Long-term closures of the shoulders adjacent to the general purpose lanes are allowable provided the closure is separated by concrete barrier as approved by the Department. This clause shall not apply to shoulder lanes that are operated by a Shoulder Lane Monitoring System (SLMS).
- M. Where concrete barriers are used to close the shoulder, the Developer will be required to provide pull-off areas per the requirement of the VWAPM.
- N. Connections with roads and public and private entrances shall be kept in a reasonably smooth condition at all times. Stabilization or surfacing material shall be applied to connections and entrances.
- O. The Developer shall schedule construction operations so that approved continuous access is provided for all roads, sidewalks, shared use paths, and properties. Connections or entrances shall not be disturbed by the Developer until necessary. Once connections or entrances have been disturbed, they shall be maintained and completed as follows:
 1. Connections that had an original paved surface shall be brought to a grade that will smoothly and safely accommodate vehicular traffic through the intersection, using pavement. Connections that had an original unpaved surface shall be brought to a grade that will smoothly and safely accommodate vehicular traffic through the intersection, using either the required material or a temporary aggregate stabilization course that shall be placed as soon as practicable after connections are disturbed.

2. Mainline connections shall have all lanes open during construction. If delays occur in prosecution of work for other connections, connections that were originally paved shall have at least two lanes maintained with a temporary paved surface. Those that were not originally paved shall be maintained with a temporary aggregate stabilization course.
 3. Mainline access and egress connections shall have all lanes open during construction unless otherwise agreed with the Department. Other entrances shall be graded concurrently with the roadway with which they intersect. Once an entrance has been disturbed, it shall be completed as soon as is practicable, including placing the required base and surface course or stabilization. If the entrance must be constructed in stages, such as when there is a substantial change in the elevation of the roadway with which it intersects, the surface shall be covered with a temporary aggregate stabilization course or other suitable salvaged material until the entrance can be completed and the required base and surface or stabilization course can be placed.
- P. When the Developer elects to complete the rough grading operations for the entire project or exceed the length of one full day's surfacing operations, the rough grade shall be machined to a uniform slope from the top edge of the existing pavement to the ditch line.
- Q. When the surface is to be widened on both sides of the existing pavement, construction operations involving grading or paving shall not be conducted simultaneously on sections directly opposite each other. The surface of pavement shall be kept free from soil and other materials that might be hazardous to traffic. Prior to opening of new pavement to traffic, shoulders shall be roughly dressed for a distance of 3 feet from the edge of the paved surface.
- R. Where the Developer places obstructions such as suction or discharge pipes, pump hoses, steel plates, or any other obstruction that must be crossed by vehicular traffic, they shall be bridged in accordance with plans submitted by the Developer and approved by the Department. Traffic shall be protected by the display of warning devices both day and night. If operations or obstructions placed by the Developer damage an existing travelled roadway, the Developer shall cease operations and repair damages.
- S. Where existing hydraulic cement concrete pavement is to be patched, the Developer shall restore all repaired pavement at the end of each shift such that the travel lane is open for use. Failure of the Developer to comply with the time frames listed in Table 1.8a, shall subject the Developer to associated Liquidated Damages for Lane Closures. Necessary precautions shall be taken to protect traffic during patching operations.

- T. The Developer shall construct, maintain, and remove temporary structures and approaches necessary for use by traffic. After new structures have been opened to traffic, temporary structures and approaches shall be removed. The proposed design of temporary structures shall be submitted to the Department for its approval together with other associated Design Documentation prior to Limited Notice to Proceed.
- U. If the Developer fails to remedy unsatisfactory maintenance not complying with these Technical Requirements after receipt of a written notice by the Department, the Department may proceed with adequate forces, equipment, and material to maintain the project, without interference from the Developer. The cost of the maintenance, plus 25 percent for supervisory and administrative personnel (including fully burdened wages plus overhead), will be paid by the Developer.
- V. **Developer shall enter** or shall cause to enter all lane closures on a weekly basis with appropriate daily confirmations for accuracy into the Department's Lane Closure Advisory Management (LCAM) system.
- W. All MOT plans affecting and adjacent to WMATA facilities are subject to review and approval by WMATA.
- X. All temporary traffic signal plans shall be submitted to the Department for review and approval prior to the Construction Phase, detour, or traffic shift. Construction signs and pavement markings (temporary) shall be installed, maintained, adjusted, and removed by the Developer throughout the duration of the Project.
- Y. Sidewalk or shared use path connections that had an original paved surface shall be brought to a grade that will smoothly and safely accommodate pedestrian and bicycle traffic through the intersection.

1.10 Third Parties and Permitting

1.10.1 Permitting

- A. The Developer shall coordinate in its dealings with Governmental Authorities and other entities having interests in the Project, with assistance from the Department. All government and other entity approvals applicable to design and construction Work will be the responsibility of the Developer. The Developer shall provide copies of all permits and permit modifications to the Department upon receipt.
- B. The Developer shall obtain any required waiver or variance of each applicable city or county noise ordinance as needed to prosecute the Work. The Department will make reasonable efforts to assist the Developer in obtaining any such waiver or variance. The Developer shall adhere to the requirements of

the noise waiver in planning, and performing any construction activities through noise mitigation if warranted. If the city or county identifies a violation all costs associated with any delays or corrective action is the responsibility of the Developer.

- C. The Developer shall be responsible for all costs associated with compliance with any ordinance and law or any violations of Law attributed to the activities of the Developer in accordance with the Agreement.

1.10.2 Third Parties

- A. If any portion of the Project is located within the limits of a municipality, military installation, or other federally owned property, the Developer shall cooperate with the appropriate officials and agents in the prosecution of the Work to the same extent as with the Department.
- B. The Developer shall coordinate its activities with other contractors, localities, WMATA, Capital Beltway Express (CBE), and Norfolk Southern Railway working in the area. As provided in the Agreement, the Developer's work program and schedule shall consider and coordinate with the work and business activities of other contractors, localities, WMATA, CBE, and Norfolk Southern Railway involved with adjacent work, including maintenance, in the corridor.
- C. If other separate contracts are awarded by the Department or by other Governmental Authorities, including projects under the Public Private Transportation Act (PPTA), that affect the Developer's work, including work related to abutting roadways and connectors and work associated with a VDOT maintenance contract (Turnkey Asset Maintenance Services (TAMS) contract), the Developer will coordinate its work with the work being performed by the other contractors. The Department will require its separate contractors to cooperate with, and coordinate their activities with, the Developer.
- D. The Developer shall be responsible for contacting other contractors, localities, WMATA, and Norfolk Southern Railway regarding their anticipated schedules to complete the associated projects or key milestones of the associated projects they may be working on. These contractors may be working on other improvement projects such as, but not limited to, the following:
 - 1. I-66 Widening from US 15 in Haymarket to US 29 in Gainesville
 - 2. VDOT preventative maintenance contracts
 - 3. VDOT operational contracts
 - 4. Transform I-66 Inside the Beltway Tolling
 - 5. Transform I-66 Inside the Beltway Widening

6. I-66 and US 15 Interchange Reconstruction
 7. Projects listed in the current 6-year plan
 8. Locality projects
 9. WMATA or railroad projects
 10. Intersection and Drainage Improvements at Fairfax Boulevard (US 29/US 50 and Route 123)
 11. Northfax Intersection and Drainage Improvement Project
- E. The Developer shall not impede the access or progress of such work by other contractors, but shall cooperate and coordinate with other contractors for the timely completion of all construction activities. This shall include attendance at coordination meetings deemed necessary or advantageous by the Department or the Contractor.
- F. The Developer and/or separate contractor shall assume all liability, financial or otherwise, in connection with its contract and shall protect and save harmless the Department from any and all damages and claims that may arise because of any inconvenience, delay, or loss the Developer experiences as a result of the presence and operations of other design-builder(s) and/or separate contractor(s) working in or near the work covered by the Developer's contract. The Developer shall also assume all responsibility for any of its work not completed because of the presence or operation of other design-builder(s) and/or separate contractor(s).
- G. The Developer shall be responsible for coordinating the design and construction of this Project with CBE, the I-495 Express Lanes concessionaire.

1.10.3 Fire Hydrants

- A. No Work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.
- B. When the Developer's Work requires the disconnection of 'in-service fire hydrants, the Developer shall notify the locality's fire department or communications center at least 2 weeks prior to disconnection. In addition, the Developer shall notify the locality's fire department or communications center no later than 24 hours after reconnection of such hydrants. The period of time hydrants may be out of service shall be approved by the Department and the locality.

1.11 Emergency Services

1.11.1 Liaison

The Developer shall comply with the Department requirements for participation in industry and statutory initiatives regarding incident and emergency management throughout the Term.

1.11.2 Emergencies and Extraordinary Circumstances

- A. The Developer's response to emergencies and extraordinary circumstances during the Term as part of the Project will be in accordance with the Agreement and not inconsistent with the Department's emergency operations and evacuation plan and shall ensure the following:
1. Safety of motorists, pedestrians, bicyclists, and workforce personnel shall be the primary objective for all decisions and actions;
 2. Clearance of a travel lane for emergency response vehicles shall be by the most expedient route whether general purpose lanes or Express Lanes (in such circumstances, the decision of the Department or the emergency services in charge shall govern);
 3. Military vehicles acting in an emergency response capacity or in defense of the sovereign homeland of the United States of America shall be given free and unrestricted access to the Express Lanes;
 4. If the U.S. Secret Service, in coordination with the Virginia State Police, determines movements of the President of the United States or other dignitary require use of the Express Lanes, the Developer shall cooperate and comply fully with their instructions with respect to work activities, lane closures, and traffic management;
 5. The Department reserves the right, by direction of the Northern Virginia District Administrator, the Northern Regional Operations (NRO) Regional Operations Director, or designee to assume and exercise control of the Express Lanes in part or in their entirety, including all applicable systems and field devices via available interfaces, pursuant to the Agreement; and
 6. The Developer will, as requested or determined by the Department, participate in emergency exercises conducted by governmental authorities.
- B. During special events that have significant impact on traffic flow, the Developer shall designate a responsible party in charge to work with the Department's NRO Special Events or incident management coordinator to develop traffic management plans for the event.

- C. Should the Developer fail to respond to an emergency or extraordinary circumstance in a timely manner in accordance with the requirements of the Agreement, the Department shall have the right to take necessary and appropriate action to handle such emergency or extraordinary circumstance.
- D. The Developer shall assure that interoperable radio communications are available and used between its Operations Center and the Department's Transportation Operations Center.
- E. The Developer shall assure that its personnel operate in a manner consistent with the Commonwealth of Virginia's Statewide Traffic Incident Management Plan. The Developer shall train its roadway responders to the Second Strategic Highway Research Program (SHRP2) or equitable standard, as endorsed by the Commonwealth of Virginia's Statewide Traffic Incident Management Committee.
- F. The Developer may request the Department's Safety Service Patrol or incident management coordinator assistance if needed. The Department may request the Developer's Safety Service Patrol or incident management coordinator assistance, if needed. Neither the Department nor the Developer are required to provide assistance to the other entity, and provisions will be at the discretion of the assisting entity.
- G. The Department vehicles may use the Developer's roadways, without charge, for response to incidents, regardless of location, when use of the Developer's roadways result in safer or prompter response.

1.12 Safety

1.12.1 General Requirements

- A. In accordance with the Agreement, the Department and the Developer recognize that in every circumstance, activity, and decision related to the Project, safety of the public, Department personnel, and Developer personnel is the primary concern. Ensuring and maintaining safety on the Project shall supersede any and all other objectives.
- B. The Developer shall designate a full-time Project designated safety representative for the Term. The Project safety representative shall ensure that Developer safety plans, policies, and methods are compliant with all applicable standards, regulations, and laws. The Project designated safety representative, and designees, shall be available to the Department and emergency services personnel at all times. The Developer shall provide and designate four segment safety managers and five field safety supervisors in order to maximize safety management and monitoring from Construction Notice to Proceed for each segment through completion of each segment.

- C. All Project safety managers and safety supervisors shall obtain Safety Trained Supervisor (STS) certification prior to working on the Project, and shall keep the certification current.

1.12.2 Safety Monitoring

- A. The Developer shall use its Near Miss Program in order to perform root cause analyses of events that could have resulted in an accident or injury. Workers shall be incentivized to submit near miss information to the program. Information derived as a result of this program shall be shared with the Department.
- B. Information gathered from the Near Miss Program shall be used to review safety hazards and implement predictive solutions as appropriate.

1.13 Quality Assurance and Quality Control

1.13.1 General Requirements

- A. The Developer shall or shall cause to be developed, implemented, and maintained a quality management system that includes a QMSP that meets the standards and specifications set forth in Attachment 1.5, including the Department's *Minimum Requirements for Quality Assurance & Quality Control on Design-Build & Public-Private Transportation Act Projects* (QA/QC Guide). Where appropriate, the QMSP shall also incorporate requirements from the Department's *Manual of Instruction-Materials Division*, design manuals, *Construction Manual*, *Instructional Informational Memoranda*, *Maintenance Manual*, *Survey Manual*, *Right of Way Manual*, *Utility Relocation Manual*, and *Inspection Manual*, as well as the *Road and Bridge Specifications*, *Road and Bridge Standards*, *MUTCD*, and *Virginia Work Area Protection Manual*.
- B. The QMSP shall describe the system, policies, and procedures that address the Work required, delivering the Project and providing documented evidence that the Work was performed in accordance with the Agreement.
- C. The Developer's Contractors, subconsultants, 2nd tier or 3rd tier subconsultants shall adhere to the QMSP.
- D. Neither the Developer nor any of its Contractors, subconsultants, or suppliers shall be delegated quality management responsibility in any manner such that the Developer is relieved of any responsibility or liability for the performance of those entities. At all times, contractual and otherwise, and by all means, the Developer shall be contractually responsible for the quality compliance of the Project no matter the provider of services or supplier of material.

- E. The Developer shall review and report to the Department its compliance with all PDPs, in accordance with the schedule in Attachment 1.3, as part of their quality systems.
- F. The Developer and its Contractors shall ensure that their quality records are available to the Department, in accordance with the Agreement, in order to enable them to monitor and establish whether the Developer's obligations under the Agreement are met.

1.13.2 Design Management

- A. The Developer is responsible for design quality in accordance with the QA/QC Guide. The 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 be responsible for all of the design, inclusive of QA/QC activities. Members of the Design QA/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 Agreement. 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 the Department assurance that the design plans and submittals will meet all contract requirements. The Quality Assurance Manager (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 Agreement and the Design QA/QC Plan.
- B. Appendix 2 of the QA/QC Guide provides minimum requirements that shall be met for development of the Design QA/QC Plan.

1.13.3 Construction Management

- A. The Developer shall develop, execute, and maintain a Construction QA/QC Plan for the full duration of the Construction Period in accordance with the Department's QA/QC Guide. The Developer shall have the overall responsibility for both the QA/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 and 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 independent, AMRL-certified testing laboratories will be required, one for QA testing and one for QC testing.
- B. The Quality Assurance Manager shall also mean the Lead Quality Manager.

- C. The QAM shall have the authority to enforce the Agreement requirements when deficient materials or unsatisfactory finished products fail to conform to the Agreement. The QAM, in accordance with his or her assignment, shall be responsible to observe the construction in progress and to ensure the QA/QC testing and inspection is being performed in accordance with the Agreement. The Developer shall establish and maintain a Quality Assurance Auditing and Non-conformance Recovery Plan (AR Plan) for uniform reporting, controlling, correction and disposition, and resolution of non-conformance (including disputed non-conforming items) issues that may arise on the Project. The Developer's AR Plan shall establish a process for review and disposition of non-conforming 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. An NCR referenced by a unique number shall be forwarded to the Contractor and the Department within seven (7) days of discovery of the non-conformance. Non-conformance procedures are provided in the QA/QC Guide.
- D. The Developer shall also be responsible for providing QA/QC testing for all materials manufactured off-site.
- E. The Developer may use the Department's resources for the following construction quality control activities where the Department routinely provides these services:
1. Off-site programmatic inspection, including supplier plant acceptance inspections;
 2. Off-site programmatic testing, including supplier plant acceptance testing; and
 3. Items on the Department's pre-approved list.
- Inspection by the Department Representative shall not relieve the Developer of any obligation to furnish acceptable materials and to provide acceptable engineered designs and completed construction that is in accordance with the Agreement.
- F. The Department shall be reimbursed by the Developer for all expenses associated with off-site plant inspections if a non-conforming condition causes the need for any additional Department off-site plant inspection.
- G. The QAM shall establish quantities prior to commencing construction, and provide the Department 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 QA/QC Guide. The Department 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 the Department based on these quantities.

- H. The QAM shall be responsible for the QA inspection, witnessing and testing of all materials and equipment 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 Attachment 1.5), documentation of all materials, sources of materials and method of verification used to demonstrate compliance with the Agreement. This includes all materials where QA testing is to be performed by the Department. The QAM shall be vested with the authority and responsibility to stop any work not being performed according to the Agreement. The construction QA and QC inspection personnel shall perform all of the construction inspection and sampling and testing work in accordance with the Agreement. This includes the documentation of construction activities and acceptance of manufactured materials. The Developer's Quality Assurance firm shall have a presence onsite during any and all construction operations to ensure all construction work and QC activities are being performed in accordance with the Agreement requirements.
- I. The QAM shall assign, at a minimum, one Lead QA Inspector for Construction to the Project prior to the start of construction. This individual 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 Agreement. The Lead QA Inspector for Construction 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 for Construction shall report directly to the QAM.
- J. In addition to the Lead QA Inspector for Construction, the QAM shall assign the following additional Lead QA Inspectors, who shall report to the QAM:
 - 1. Lead QA Inspector for Electrical/ITS/Tolling;
 - 2. Lead QA Inspector for MOT; and
 - 3. Lead QA Inspector for Environmental Compliance.
- K. 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.

- L. All construction QA/QC personnel shall hold current Department materials certifications for the types of materials testing that they are assigned to perform in accordance with the 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 Developer's construction manager. Substitution of Developer's construction manager and the QAM shall require Department approval. In addition, the Department shall have the right to order the removal of any construction QA/QC personnel, including the QAM and the Developer's construction manager for poor performance at the sole discretion of the Department project manager. The QA/QC plan shall include rapid reporting of non-compliance to the Department project manager, and shall include the remedial actions to be taken as discussed in the QA/QC Guide.
- M. All Electrical/ITS/Tolling testing will be performed in accordance with electrical and communications standards and documented to meet the design details, standards, and system requirements.
- N. The Developer shall provide, prior to Project Completion, a complete set of Project records that include, but are not limited to, the following:
 - 1. Project correspondence;
 - 2. Project diaries;
 - 3. Test reports;
 - 4. Invoices;
 - 5. Materials books;
 - 6. Certified survey records;
 - 7. DBE and SWaM records;
 - 8. Right-of-Way records;
 - 9. Utility records;
 - 10. Warranties;
 - 11. As-built drawings; and

12. Special tools.

1.13.4 Removal of Unacceptable Work

- A. Work will be considered unacceptable if it: (a) does not conform to the requirements of the Agreement; (b) is performed contrary to the instructions of the Department; or (c) is performed without the authorization of the Department. Unacceptable work shall be remedied or removed immediately unless otherwise determined by the Department, and replaced in an acceptable manner at the Developer's expense. The Department may elect, in its sole discretion, to accept otherwise unacceptable work at a reduced price and a warranty extended to five (5) years for the subject portion of the Work when acceptance is considered to be in the best interest of the public.
- B. The Developer shall not perform destructive sampling or testing of the work without written authorization of the Department. Unauthorized destructive sampling or testing will cause the work to be considered unacceptable.
- C. In the event the Developer is granted authorization to perform destructive sampling or testing, the Developer shall obtain the approval of the Department for the method and location of each test prior to beginning such sampling or testing. In addition, destructive sampling and testing shall be performed in the presence of the Department.
- D. If the Developer fails to comply immediately with any order of the Department made under the provisions of this Section 1.13.4, the Department will have the authority to cause unacceptable work to be removed and replaced and to deduct the cost from any monies due or to become due the Developer.

2 Communications

2.1 General Requirements

2.1.1 General Requirements

The Developer, in collaboration with the Department, shall develop procedures for public outreach, media relations, and marketing in the form of a Communications Plan, which will be consistent with the Agreement and the requirements included in Attachment 1.3. The Communications Plan shall define the roles and responsibilities between the Department and the Developer.

2.1.2 Project Communications Team

- A. The Developer shall establish a Project communications team through which all communication and public outreach activities will be coordinated.
- B. The Project communications team shall include a single point of contact responsible for coordinating Project communications with the Department.

2.1.3 Interface and Liaison with the Department

- A. Management protocols shall be developed between the Developer's Project communications team and the Department. These protocols shall detail:
 - 1. Regular reporting to the Department on communications and public information activities, current and outstanding community and political issues, and recent media activity;
 - 2. Media protocols, providing clarity of responsibility in relation to media comment on particular aspects of the Project;
 - 3. Stakeholder relations protocols, assigning responsibility for briefing and information to stakeholders on Project progress and milestones;
 - 4. The development and approval of Project marketing, communications, and public outreach material; and
 - 5. Processes for managing communications surrounding emergency management and recovery operations.
- B. Meetings and public interface required by federal and state law shall be conducted in accordance with the current version of the Department's *Policy Manual for Public Participation in Transportation Projects*. The Developer, in coordination with the Department, shall conduct additional meetings, public interfacing, and marketing activities in accordance with the Communications Plan.

- C. The Developer shall collaborate with the Department in the development of all communications and marketing strategies to ensure they are consistent with both parties' values, needs, and goals. The Developer shall provide the Department with advance copies of all Project communications materials for review and approval prior to dissemination.

2.2 Public Outreach

2.2.1 Stakeholder Outreach

- A. The Developer shall plan and hold a Design Public Hearing in collaboration with the Department to present its design plans in accordance with Department policies and procedures. The Developer shall prepare all materials necessary for the Design Public Hearing. The Department will work collaboratively with the Developer to streamline the Design Public Hearing process where possible.
- B. The Developer shall develop and maintain a comprehensive stakeholder database to track and manage stakeholder communications.
- C. The Developer shall provide content and support as needed to update and maintain the Department's Project Website, which will serve as the sole site for Project information through Project Completion.
- D. The Developer shall provide a point of contact and phone number for the public to ask questions and share concerns during the Project. The point of contact shall respond to inquiries within a reasonable time under the circumstances.
- E. The Developer shall hold informal meetings with affected stakeholders as necessary and as directed by the Department.
- F. The Developer shall support as needed the following stakeholder outreach efforts by providing subject-matter experts and a communications person(s), as well as any necessary information materials:
 - 1. Home Owners Association (HOA) and civic association meetings;
 - 2. Traveling open houses held throughout the corridor on a recurring basis;
 - 3. Pop-up events at special events; and
 - 4. Briefings for elected officials and special groups.
- G. The Developer shall use appropriate social media platforms in order to alert stakeholders of real-time construction activities, Project accomplishments, traffic pattern changes, and other similar impacts to stakeholder daily routines. The social media platforms also shall be used to publicize other Project information.

- H. The Developer shall create a **WMATA outreach program** that will include geo-coded advertising, information booths and brochures, in-person communications, and sharing information for WMATA use.
- I. The Developer shall use an application to **live stream construction activities**.
- J. The Developer shall host tele-town halls to provide opportunities for stakeholders to participate remotely in discussions about Project activities.
- K. The Developer shall conduct benchmark polling to identify key message points that will frame prospective messaging and branding. The Developer shall conduct periodic tracking polls to gauge public feedback, identify strengths and weaknesses in public perception, and improve the end product.
- L. The Developer shall partner with local businesses to develop radio ads that promote the Project and the local businesses.
- M. **The Developer shall create and operate a Project Visitor Center to communicate aspects of the Project.** At a minimum, the Visitor Center shall be equipped with Project schematics, various displays such as Project renderings and sound barrier mock-ups, a visitor log, and staffed with a Project representative to address public inquiries.

2.2.2 Elected Official and Agency Outreach

- A. As part of the Communications Plan, the Developer shall provide the planning and effort necessary for effective elected official and agency outreach. At a minimum, the elected official and agency outreach plan shall include status updates, key stakeholder issues, and upcoming Project activities.
- B. The Developer shall support the Department as needed to implement the elected official and agency outreach plan.

2.3 Media Relations and Outreach

- 2.3.1** The Developer shall support the Department in implementing a targeted, well-managed, earned media, and paid advertising program to engage the traveling public about construction-related issues and timelines throughout the Project. This shall include, but is not limited to, the following:
 - A. Packaging or reporting of all MOT information, such as anticipated delays and lane closures, on a regular basis; and
 - B. Communications with property owners in direct impact areas.

2.3.2 The Developer shall assist the Department in identifying media opportunities, implementing media events, and informing and responding to the media about the Project.

2.3.3 The Developer shall:

A. Provide a set of its media protocols related to the Project, upon which the Department and Developer shall agree, including guidelines for information sharing, policies to promote consistent messages, and procedures specific to managing emergencies and incidents.

B. Monitor all media coverage of the Project.

2.3.4 The Developer shall provide the Department with advance copies of all press releases and press materials for review and approval prior to dissemination.

2.4 Express Lanes Communications

2.4.1 Communication Program

A. No less than twelve (12) months prior to the Service Commencement Date the Developer shall implement a public education and marketing program to ensure that motorists and all stakeholder groups are educated about the features and benefits of the Project, so that they can make an informed choice about their use of the Express Lanes once open to traffic.

B. The Developer shall provide a public engagement and awareness program to fit within the context of the broader Communications Plan for the Project. It shall address but will not be limited to:

1. Education about dynamic pricing, if used;
2. Information on requirements for using Express Lanes, including HOV eligibility and transponder requirements;
3. Plans for the opening of the Project to traffic and communications that will facilitate smooth ongoing operations;
4. Interfacing with the Department's E-ZPass marketing and communications, to facilitate distribution of transponders to motorists who intend to use the Express Lanes;
5. Education about driver information systems in use on the Express Lanes, so motorists understand on-road sources of information that will facilitate choice and lane control signals (LCS) of the lane-use management system (LUMS), if applicable;

6. Provision of information to motorists and stakeholders to facilitate the MOT during ongoing maintenance activities during the Operations Period. This shall include:
 - 6.1 Packaging of all MOT information, such as anticipated delays and lane closures, for provision to the Project communications team and to the Department's communication team on a regular basis, to facilitate communication with the media, stakeholders, and the broader community; and
 - 6.2 Communications with property owners in direct impact areas.
- C. No less than 12 months prior to the Service Commencement Date, the Developer shall establish a customer facing website that informs the public on the operational nature of the Express Lanes.
- D. The Developer shall provide its in-house mobile application (Drive On) to provide useful information regarding tolling, maps, payment options, and traffic alerts.

2.4.2 Project Branding

- A. The Developer shall provide graphics and artwork to support the Project brand. The graphics and artwork shall be consistent with the branding used on other Express Lane systems in the Northern Virginia region and must be approved by the Department prior to publication.
- B. The Developer shall conduct market research as necessary to guide marketing and communication activities.
- C. The Developer shall establish Project communication benchmarks and measure and report on community awareness, attitudes, and satisfaction towards the Project.

3 Design and Construction Requirements

3.1 General Requirements

- 3.1.1** The Project shall be designed and constructed pursuant to the design criteria and specifications set forth in the Technical Requirements. The Developer must verify and use the latest version of the documents listed herein as of the date of the final RFP issuance or latest addenda. The Developer must meet or exceed the minimum roadway design standards and criteria, and must apply appropriate standards and criteria, to accommodate all classes of Permitted Vehicles.
- 3.1.2** If during the course of the design, the Developer determines that a specific Standard, Specification or Reference Document is required but is not listed herein, then the Developer shall first verify with the Department whether any such Standard, Specification or Reference Document exists. If not, then it shall be the responsibility of the Developer to establish the pertinent Standard, Specification, or Reference Document in accordance with generally accepted Good Industry Practice and submit to the Department for review and approval prior to inclusion in the Agreement.
- 3.1.3** The Developer is responsible for achieving the Work in accordance with all current Department standards as of the date of the final RFP issuance, including any revisions and addenda. If a construction element is not adequately addressed within VDOT Standard Specifications or the Special Provisions listed for the purpose of the Public Private Partnership project design, it is the responsibility of the Developer to develop alternative specifications in accordance with generally accepted Good Industry Practice for Department review and approval.
- 3.1.4** To the extent practical, the Work shall not preclude local, state, and federal long-range transportation planning improvements. The Developer shall identify any potential conflicts and shall demonstrate that reasonable accommodations have been incorporated into the design. Any Work that requires future adjustments, must first be approved by the Department. A list of these potential long-range improvements is included in Attachment 3.1a.
- 3.1.5** All Design Documentation and Construction Documentation shall comply with the requirements of applicable Governmental Authorities including the Washington Metro Area Transit Authority (WMATA). The Developer solely shall be responsible for acquiring design criteria deviations from WMATA for WMATA related work.
- 3.1.6** 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 the Department minimum standards or for any element other than the fourteen controlling criteria that do not meet AASHTO

minimum design standards. The Developer 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. The Developer shall submit design exceptions for Department and FHWA approval and design waivers for Department approval. The Department has the sole right to approve or reject any additional DEs or DWs that were not included in the RFP package.

- 3.1.7** The table of design exceptions and design waivers related to the Department’s RFP Conceptual Plans are included in Attachment 3.1b along with the preliminary justification to seek the design exception or waiver. The Developer is responsible either to eliminate the need for the design exception or waiver through design improvements or to apply for the appropriate design exception or waiver. Potential design waivers associated with interchange ramps as depicted on the RFP Conceptual Plans are not included in Attachment 3.1b. Ramps shall be designed to meet the fourteen controlling criteria, based upon the design speed of the specific ramp element, and in accordance with VDOT GS-R standards, unless the Developer can demonstrate that a design waiver is justified by geometric constraints or to avoid impacts outside the limits shown on the RFP Conceptual Plans.

By submitting its cost proposal, the Developer certifies that the Project concept submitted in its cost proposal is fully compliant with the minimum design requirements as outlined in the Agreement. The Department is in the process of obtaining approval for design exceptions and design waivers identified to be obtained by the Department in Attachment 3.1b. Previously submitted design exceptions and design waivers are subject to reevaluation if additional information becomes available that was not known at the time of initial submittal or conditions change that were used in the analysis of the original design exception or design waiver and, in either case, such additional information or changed conditions affects the premise on which the original design exception or design waiver at issue was based.

- 3.1.8** The Developer shall ensure that the condition of existing buildings, structures, roadways, sidewalks, paths, trails, lighting and signal equipment, or other property that is to remain is not affected by the performance of the Work. Prior to commencing Work, the Developer shall perform property pre-condition surveys and monitor their condition during the Work Period. The Developer shall repair any damage deemed to be caused by the Work. The Department shall be given the opportunity to witness any pre-condition surveys or monitoring and the Developer shall make the results available to the Department before commencing any Work that may affect the property. Any damaged curb ramp that needs to be replaced shall be brought up to current standards as required by ADA.
- 3.1.9** The Project is considered part of the Strategic Highway Network (“STRAHNET”).
- 3.1.10** All Design Documentation and Construction Documentation shall be in English units.

- 3.1.11** The Developer shall ensure that areas impacted by the Work are subject to continual and un-interrupted removal of rubbish, scrap material, and debris. Work sites shall have a neat, safe and orderly appearance at all times. The Developer shall remove its construction equipment, materials and debris from the Project ROW and other property adjacent to the Project by Project Completion.
- 3.1.12** The Developer shall preserve property and improvements along the boundary lines of and adjacent to the Work unless the removal or destruction is absolutely required and consistent with the Construction Documentation. The Developer shall use suitable precautions to prevent damage to such property. If property is damaged, the Developer shall restore property to a condition similar or equal to that existing before such damage was done by repairing, rebuilding, or restoring, as may be directed by the Department, or making settlement with the property owner. The Developer shall secure from the owner a release from any claim against the Department. A copy of this release shall be furnished to the Department.
- 3.1.13** The Developer shall provide letters to the property owners at the address on record that comply with the Code of Virginia § 33.2-1011, Right of Entry.
- 3.1.14** The Project includes construction of two (2) Intermediate Milestones, the Route 28 Signalization and the Park and Ride Lot.

A. Route 28 Signalization

The Intermediate Milestone includes improvements on Route 28 that eliminate four (4) signals (at the EC Lawrence Park entrance, at the Braddock Road/Walney Road intersection, and two (2) signals at the I-66/Route 28 interchange). In order to eliminate the 4 signals and achieve the Intermediate Milestone, the Developer shall complete the following:

1. Construct and open to traffic new Ellanor C. Lawrence Park Access Road and the connection to Poplar Tree Road, including improvements with new bridge over Route 28 and connections to Westfields Boulevard and Newbrook Drive.
2. Construct appropriate segments of the new Braddock Road/ Walney Road/ Route 28 interchange and Route 28/I-66 interchange to permit the removal of the traffic signals while providing all movements in the ultimate configuration.

B. Park-and-Ride Lot

The Intermediate Milestone includes the full and continuous use of a Park-and-Ride (P&R) lot with a minimum of 960 parking spaces at or near Balls Ford Road or Gainesville (University Boulevard). The P&R lot and its access shall safely and efficiently accommodate buses, cars, bicycles, and pedestrians. The P&R lot shall have safe and reasonably direct access to I-66.

3.2 Environmental

3.2.1 Environmental Document

- A. FHWA has issued a NEPA decision for the Project. A copy of the Tier 2 Finding of No Significant Impact (FONSI) and Tier 2 Final Environmental Assessment (EA) dated June 22, 2016, is included in the RFP Information Package. The Department has also completed preliminary document re-evaluations for Right of Way (ROW) Authorization (EQ-201) dated June 27, 2016, Plans, Specifications and Estimates (PS&E) Authorization (EQ-200) dated June 27, 2016; and a preliminary Environmental Certification/Commitments Checklist (EQ-103) dated June 13, 2016, which are included in the RFP Information Package. Upon completion of the preliminary document re-evaluations by the Department to FHWA, as evidenced by the submission of EQ-201, EQ-200, and EQ-103, the Developer shall complete final document re-evaluation certification for all design packages and submit draft copies of forms EQ-201, EQ-200, and EQ-103 to the Department. The Department will complete a final document re-evaluation for ROW Authorization (EQ-201) prior to ROW authorization and a final document re-evaluation for PS&E Authorization (EQ-200) and final Environmental Certification/Commitments Checklist (EQ-103) prior to the Department releasing the Project for ROW and construction. If the Project includes phased work for ROW acquisition and construction, then final versions of these environmental documents shall be completed by the Department prior to authorizing ROW and construction for each phase. The Developer shall clearly identify each work phase in their submission for the Department to prepare these environmental documents.
- B. The Developer shall carry out environmental commitments during design, ROW acquisition, and construction, as applicable, as identified in the FONSI/EA, the document re-evaluations for ROW and PS&E authorizations, and the Environmental Certification/Commitments Checklist forms. The Developer shall provide supporting documentation evidencing commitment compliance to the Department.
- C. Any changes in the scope or footprint of the established basic Project concept, proposed by the Developer and acceptable to the Department, may require additional environmental technical studies and analysis to be performed by the Developer. The Developer shall be responsible for notifying the Department of plan revisions, scope changes, and providing any necessary studies and other necessary information to support the Department's completion and re-evaluation of the NEPA document. The Department will be responsible for the coordination of NEPA document re-evaluations with FHWA. The Developer shall then carry out any additional environmental commitments that result from such coordination.

3.2.2 Cultural Resources

A. On December 2, 2015, the VA State Historic Preservation Office (SHPO) concurred with the Department’s determination that the Project would have No Adverse Effect on historic properties in the Area of Potential Effects (APE) provided that the following conditions are met:

- The VA SHPO, Manassas National Battlefield, and consulting parties, shall be afforded the opportunity to review and comment on design plans to ensure that the final design remains consistent with the No Adverse Effect determination.
- A safety fence shall be erected around and prohibit construction disturbance to all archaeological sites and cemeteries in close proximity to the project limits and that will be avoided. These resources include 44FX1552, 44FX1834, 44FX3767, 44PW0080 (Monroe Cemetery), 44PW1040/076-5035 (Ody Cemetery), and 076-5719 (Wheeler Cemetery).

The APE for architectural resources includes the project footprint and extends approximately 500 feet beyond the existing Department right-of-way on both sides of the transportation corridor and larger intersection areas, creating a 1,000-foot wide corridor around the existing transportation corridor. The APE for archaeology includes the Project footprint and extends no more than 100 feet from the existing Department right-of-way on both sides of the corridor. The proposed stormwater ponds and P&R lot locations also are within the APE. Copies of relevant VDOT and VA SHPO correspondence and RFP Conceptual Plans showing the location of historic properties are included in the RFP Information Package. According to the EA, there are nine historic properties and one historic resource that have not been evaluated within the Project’s APE (see Table 3.2a below). Table 3.2a is provided for reference only.

Table 3.2a Historic Properties within the Project’s APE		
Town, City, or County	DHR No.	Resource Name
Fauquier County, Prince William County	030-1016	Thoroughfare Gap Battlefield
Prince William (Gainesville, Haymarket)	030-5152	Buckland Mills Battlefield
Prince William	076-5381	Gainesville District School, 14550 John Marshall Highway
Prince William; Fairfax	076-0271	Manassas National Battlefield Park (also part of Manassas Battlefield Historic District)
Prince William; Fairfax	076-0271	Manassas Battlefield Historic District

Table 3.2a Historic Properties within the Project's APE		
Town, City, or County	DHR No.	Resource Name
Fairfax County (Centreville)	029-0428	Centreville Historic District
Fairfax (County) – portion in project area	053-0276	Washington and Old Dominion Railroad Historic District
Fairfax (County)	44FX1552	Prehistoric Camp/Lithic Scatter, archaeological site
Fairfax (County)	44FX1834	Civil War winter camp, archaeological site
Prince William	44PW1040; 076-5035	Ody Cemetery

B. The Developer shall consider historic properties to be design constraints and avoid impacting them beyond what is shown on the RFP Conceptual Plans. In addition, the Developer shall avoid any other project-related activities on or within the viewshed of these historic properties, including but not limited to staging, borrow and disposal, and any temporary or permanent easements. Note that any changes to the design, alignment, right-of-way limits, or easements shown on the RFP Conceptual Plans may require review by the Department and could require additional cultural resources studies or coordination with the VA SHPO. The Developer is responsible for conducting all cultural resources studies necessitated by the proposed changes, while the Department is responsible for coordinating both the studies and the proposed changes with the VA SHPO. The Developer 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.

3.2.3 Section 4(f) Resources

A. A Section 4(f) *de minimis* determination was made with respect to the following Section 4(f) resource:

<u>Section 4(f) Resource</u>	<u>Use</u>
Random Hills Park	0.03 acres— <i>de minimis</i>

B. FHWA has concluded that there is no feasible and prudent alternative to the use of land from this Section 4(f) resource, and that the Project as currently designed includes all possible planning to minimize harm resulting from the use of these resources. The Developer shall ensure that their final design incorporates the specified minimization and mitigation measures, and is consistent with FHWA's *de minimis* impact finding. The location of this 4(f) resource is included on the RFP Conceptual Plans.

C. The RFP Conceptual Plans include construction of a new park entrance and access road off of the Poplar Tree Road extension through the north end of Ellanor C. Lawrence Park to the existing athletic fields. The new park access

road is mitigation for the removal of the Route 28 entrance and stoplight to the athletic fields and is solely for the purpose of preserving and enhancing activities, features and attributes that qualify Ellanor C. Lawrence Park for Section 4(f) protection. Further, the new park access road would be constructed under temporary easement under permit from the Fairfax County Park Authority (FCPA) and would not constitute a conversion of land use. Pursuant to 23 CFR 774.13(g)(1), mitigation activities are not subject to Section 4(f). Concurrence with exception from Section 4(f) of the proposed park access road was received from the FCPA on December 29, 2015 and conditioned on further coordination with FCPA during the project's final design development and obtaining a license from the FCPA for construction of the new park access road under temporary easement.

- D. The Developer shall provide reforestation on a portion of Manassas National Battlefield Park property as shown in Attachment 3.11. To accomplish the proposed reforestation, temporary easement under permit from the U.S. National Park Service (NPS) into the property will be required and will not constitute a conversion of land use. Pursuant to 23 CFR 774.13(g)(1), mitigation activities such as the reforestation are not subject to Section 4(f). Concurrence with exception from Section 4(f) of the proposed reforestation on the Manassas National Battlefield Park property has been requested from the NPS and will be provided to the Developer when available. The Developer will be responsible for further coordination with NPS during the Project's final design development and obtaining a license or permit from NPS for accessing the historic battlefield park.
- E. In addition, there are three existing trails located on roadway bridges that overpass I-66 within the Project limits: The Gerry Connolly Cross County Trail (Pickett Road/Blake Lane/Jamestown Road Trail Segment; I-66 overpass on Blake Lane) which is under jurisdiction of the Fairfax County Park Authority (FCPA), the W&OD Trail/City of Fairfax Connector Trail (I-66 overpass on Vaden Drive) which is under jurisdiction of NOVA Parks, and the W&OD Trail (I-66 overpass on Virginia Lane) which is under jurisdiction of NOVA Parks. The Developer shall ensure that the continuity of these trails is maintained and that they remain open and operational during construction. During construction, the Developer may implement a trail detour or alternative path in order to facilitate construction interruption to these trails as approved by the Department and the appropriate Park Agency.
- F. According to the EA, and as shown in Table 3.2b below, there are a number of Section 4(f) resources within the Project vicinity. The locations of these resources are shown on the RFP Conceptual Plans.
- G. The Developer shall consider 4(f) resources to be design constraints and avoid any impacts to them beyond the acres of use identified in this section. In addition, the Developer shall avoid any other project related activities on these

resources, including but not limited to staging, borrow and disposal, and temporary or permanent easements.

Table 3.2b Resources Subject to Section 4 (f)*	
RESOURCE NAME	OWNERSHIP/DHR No.
Thoroughfare Gap Battlefield	030-1016
Buckland Mills Battlefield	030-5152
Tyler Elementary School Recreational Facilities	Prince William County Public Schools
Conway Robinson Memorial State Forest	Virginia Department of Forestry
Gainesville District School, 14650 John Marshal Hwy	076-5381
Manassas National Battlefield Park	US Department of the Interior
Manassas Battlefield Historic District	076-0271
Mayhew Park	William A. Hazel Inc. & Prince William County Park Authority
Bull Run Regional Park (and West County	Northern Virginia Park Authority
Cub Run Stream Valley Park	Fairfax County Park Authority
Rocky Run Stream Valley Park	Fairfax County Park Authority
Centre Ridge North Park	Fairfax County Park Authority
Ellanor C. Lawrence Park	Fairfax County Park Authority
Centreville Historic District	029-0428
Random Hills Park	Fairfax County Park Authority
Providence Elementary School Recreational	Fairfax County Public Schools
Briarwood Park	Fairfax County Park Authority
Oakton High School Recreational Facilities	Fairfax County Public Schools
Marshall Road Elementary School Recreational Facilities	Fairfax County Public Schools
Southside Park	Town of Vienna
George C. Yeonas Park	Lions TRS of Little League Vienna
Stenwood Elementary School Recreational	Fairfax County Public Schools
Idylwood Park	Fairfax County Park Authority
Washington & Old Dominion Railroad	Northern Virginia Park Authority
Washington & Old Dominion Railroad Historic District	053-0276
Hartland Green Park (formerly Merilee Park)	Fairfax County Park Authority

* This list may not be comprehensive

H. Any changes to the right-of-way or easements as shown on the RFP Conceptual Plans, proposed by the Developer and acceptable to the Department, may require additional technical studies and analysis to be performed by the Developer. The Developer shall be responsible for notifying the Department of plan revisions, right-of-way/easement changes, and providing any necessary studies and other necessary information to support the Department's completion of any required 4(f) documentation. The Department will be responsible for the coordination of any 4(f) documentation with FHWA. The Developer shall then carry out any additional commitments that result from such coordination at its sole expense and no additional cost or time delays to the Project.

3.2.4 Section 6(f) Resources

A. Two of the public parklands identified as Section 4(f) resources are also subject to Section 6(f) protections:

- Ellanor C. Lawrence Park under the jurisdiction of Fairfax County Park Authority (FCPA)
- Bull Run Regional Park under the jurisdiction of the Northern Virginia Regional Park Authority (NVRPA)

The locations of these resources are shown on the RFP Conceptual Plans.

B. The RFP Conceptual Plans include construction of a new park entrance and access road (with a parallel shared use path) off of the Poplar Tree Road extension through the north end of Ellanor C. Lawrence Park and terminating at the athletic fields. The new park access road is mitigation for the removal of the Route 28 entrance and stoplight to the park's athletic fields. Since the new park access road is solely for the purpose of providing access to active recreational activities/areas, its construction into the Land & Water Conservation Fund protected park would not constitute a conversion of land use. The Developer shall be responsible for further coordination with FCPA during the project's final design development and obtaining a license from the FCPA for construction of the new park access road under temporary easement.

C. The Preferred Build Alternative requires no right-of-way acquisition and has no direct adverse impacts to these Section 6(f) properties. The Developer shall consider 6(f) resources to be design constraints and avoid any impacts to them, including but not limited to staging, borrow/disposal, and permanent/utility easements. The Developer shall be responsible to obtain the appropriate approvals including but not limited to obtaining a license from the FCPA and the NVRPA for temporary construction easements on park property.

3.2.5 Water Quality Permits and Compensatory Mitigation

- A. The Developer is responsible for obtaining all water quality permits required to construct the Project (including utility relocations by the Developer). The Developer will be the Permittee. Should the Developer propose design changes acceptable to the Department, permitting requirements may also change; the Developer remains responsible for obtaining any and all necessary water quality permits and permit modifications required by the regulatory agencies.
- B. The Developer shall obtain all necessary environmental clearances, permits, and approvals required to accomplish the work as noted in the Agreement. The Developer shall 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 Developer shall be responsible for verifying permit requirements prior to construction. Regulatory agencies will make the final determination as to which state and federal water quality permits will be required during coordination with the Developer.
- C. The USACE issued a Preliminary Jurisdictional Determination to the Department on May 9, 2016. The Department also coordinated with the USACE to further reduce impacts associated with the Park and Ride Lots and stormwater management locations from what was reported in the EA to obtain a preliminary least environmentally damaging alternative (LEPDA) letter on June 3, 2016. The Developer shall comply with the requirements of the preliminary LEPDA letter to avoid and minimize impacts to jurisdictional areas to the greatest extent practicable. The Developer shall prepare an alternative analysis for the placement of Park and Ride lots and stormwater management facilities that impact Jurisdictional areas.
- D. The Developer shall determine the applicability of water quality permits for the Project (to include utilities to be relocated by the Developer for the Project). Should it be determined that water quality permits are required, the Developer shall conduct the preliminary field assessment including, but not limited to, wetland delineation, stream assessment, Section 404 alternatives analysis and permit impact sketches. The Developer shall also determine the required sequencing methodology to limit Project impacts to wetland systems. The Developer shall use this information to obtain required permits.
- E. If the Developer determines water quality permits are not required based on information generated, the Developer shall notify the Department in writing, so that the Department can authorize the Developer to execute the work. Any deviations that the Developer makes to the Project footprint or scope may render the permit determination invalid and will require additional consideration.

- F. If the Developer determines that wetlands or stream mitigation is required to secure the permit authorization, the Developer shall provide the required compensatory mitigation. The Developer shall account for all costs associated with water quality permit acquisition, as well as compensatory mitigation, in its price proposal.
- G. The Developer shall note that avoidance, minimization, and mitigation measures associated with permit acquisition will require close coordination with the regulatory permitting agencies. If permit issuance is delayed or permits are denied, the Developer shall be responsible for any schedule delays and associated costs.
- H. Should the Developer propose design changes acceptable to the Department, permitting requirements may also change; the Developer remains responsible for obtaining all necessary water quality permits and permit modifications required by the regulatory agencies to accommodate the design changes.
- I. The Developer shall ensure that Project schedule accommodates any special provisions, Time of Year Restrictions (TOYR), and the duration of permit acquisition from the regulatory agencies. The Developer 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.
- J. The Developer 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.
- K. The Developer shall provide to the Department 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 Developer. The Developer shall not proceed with work covered by the water quality permits until the Department releases the work in writing. The Department 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 Developer shall not be allowed to begin work that pre-determines the work required in the jurisdictional areas until the permits are secured.
- L. After receiving the Department's release of the Work, the Developer shall notify the Department and the regulatory permitting agencies in writing fourteen (14) days prior to beginning work in the jurisdictional areas covered by the water quality permits.

- M. The Developer shall allow environmental compliance inspections by the Department, and regulatory agencies as required by permits and to facilitate any interim compliance reviews and assessments.
- N. At the conclusion of the Project, the Developer shall notify the Department 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 Developer is required to transfer any Virginia Marine Resources Commission (VMRC) permits back to the Department.
- O. The Developer shall carry out any additional permit conditions and commitments that result from changes in footprint or scope (assuming it is approved by the Department); additionally the Developer shall be responsible for any schedule delays.
- P. All permitted construction activities shall be identified as Hold Points in the Developer's CPM Schedule.

3.2.6 Threatened and Endangered Species

- A. The Department has performed preliminary database reviews and coordination with the US Fish and Wildlife Service (USFWS) through USFWS's Information for Planning and Conservation (IPaC) on-line review system to determine the Project's potential effects on federally listed threatened and endangered (T&E) species. The Project corridor is within the range of the federally listed Northern Long-Eared Bat (*Myotis septentrionalis*). Additionally, suitable habitat is present at several locations for federally listed Dwarf Wedgemussel (*Alasmidonta heterodon*) and Harperella (*Ptilimnium nodosum*).
- B. The Department will complete Section 7 coordination, including necessary surveys, with USFWS for Federal T&E species, specifically the Northern Long-Eared Bat, the Harperella, and the Dwarf Wedgemussel. Preliminary determinations of *may affect* have been made for these three federally listed species, as outlined in the EA. However, final determinations regarding the Project's effects on them will not be completed until surveys are completed for them.
- C. The Department has completed a habitat assessment and acoustical bat survey, as well as a bridge survey, for the Northern Long-eared Bat (*Myotis septentrionalis*) during the 2016 summer survey season. Potentially suitable habitat for summer maternity roosting was identified and acoustic recording devices were deployed at these locations.
 - 1. Preliminary results of echolocation calls of the bat species were confirmed by detectors in the vicinity of the proposed Manassas (Balls Ford Road) Park-and-Ride lot. Coordinates of this location are shown in Table 3.2c.

2. The Department has completed a survey of all bridges in the Project area for the presence or indicators of the Northern Long-eared Bat. While no bats were visually identified, evidence of bat droppings was identified at five bridge locations along the I-66 Project corridor. Coordinates of these bridge locations are shown in Table 3.2c.

Table 3.2c Northern Long-eared Bat Locations		
Location Description	Latitude	Longitude
Manassas Park and Ride Lot	38.7977230°	77.5390470°
Bull Run Dr. Bridge over I-66	38.810981°	-77.487999°
I-66 Eastbound Bridge over Cub Run	38.815095°	-77.477128°
Rt. 29 Bridge over Big Rocky Run	38.836459°	-77.449648°
I-66 Bridges over Stringfellow Rd.	38.851734°	-77.402806°
West Ox Rd. Bridge of I-66	38.857601°	-77.402806°

3. Based on these survey results, the Developer may consider three options regarding work at these locations:
 - 3.1 Assume the bat species is present at the locations identified in Table 3.2c and apply time-of-year restriction (TOYR) between April 15 and September 15 for bridge work (substructure or demolition) and for tree clearing activities on parcel numbers 10802, 10903, 10904, 10905, and 10906 as shown on the RFP Conceptual Plans.
 - 3.2 Conduct a mist net bat survey (in accordance with USFWS guidelines) and provide conclusions on presence of the species to USFWS.
 - 3.3 Conduct another USFWS iPAC database search and consult species conclusion table with USFWS under the Final 4(d) Rule.
- D. The Developer shall comply with the results of the species surveys for Drawf Wedgemussel and the Harperella for Cub Run, Bull Run, and Big Rocky Run, as required. The conclusions of these species survey reports will be provided to the Developer when finalized.
- E. The Developer shall be responsible for coordinating all state species with the Virginia Department of Game and Inland Fisheries (DGIF). Potential habitat for two state-listed species, brook floater (*Alasmidonta varicosa*) and wood turtle (*Glyptemys insculpta*) exists within the Project limits. Both species rely on aquatic habitats for all or a portion of their life cycles. Formal surveys or habitat assessments have not been conducted for these two species. Should it be determined during the permitting process that such surveys or assessments

are necessary, the Developer shall be responsible for conducting them as part of the permit acquisition process.

- F. The Developer shall be advised that new and updated T&E information is continually added to agency databases. The Developer shall 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 Developer will be responsible. The Developer 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 Developer shall provide to the Department copies of all documentation and correspondence with regulatory agencies.

3.2.7 Hazardous Materials

- A. The Department conducted Phase I ESAs to determine the potential for hazardous materials or contamination for 23 properties within the Project corridor or right-of-way. Eleven (11) properties were identified as having recognized environmental conditions (RECs). Phase II hazardous materials investigations are recommended for the properties listed in Table 3.2d. The Developer shall be responsible for conducting Phase II ESAs on these properties. More detailed information may be found in the May 2016 *Hazardous Materials Report* which constitute Known Pre-existing Hazardous Materials sites.

Table 3.2d	
Properties Recommended for Phase II Hazardous Materials	
Site Name	Address
Atlantic Research Corporation	5945 Wellington Rd. Gainesville, VA 20155
Angler Construction Corporation	12801 Randolph Ridge La, Suite 101 Manassas, VA 20109
Monroe House Site	Within existing right-of-way, southwest quadrant of I-66/Route 234 Interchange
Merit Concrete of Virginia	7310 Old Compton Rd Manassas, VA 20109
Sam's Junkyard	14505 Lee Highway Gainesville, VA 20155
Sully Senior Center	5690 Sully Rd, Centreville, VA 20120

Table 3.2d	
Properties Recommended for Phase II Hazardous Materials	
Site Name	Address
Private Residence	13530 Audrey Drive Centreville, VA 20120
Fairfax County I-66 Transfer Station and Landfill	4618 West Ox Rd. Fairfax, VA 22030
Land Bay A (adjoining land north of Kaiser Permanente Health Care Center)	North of 12255 Fair Lakes Pkwy Fairfax, VA 22033
Phoenix Development Corporation	11112 & 11115 Phoenix Dr. Oakton, VA 22124

The Developer is responsible for conducting Phase I and Phase II ESAs for any properties to be acquired as a result of any changes in the scope or footprint of the RFP Conceptual Plans, or as may be necessary.

- B. Naturally occurring asbestos soils have been identified within the Project vicinity (see Figure 4.6 of the EA). The Developer shall abide by the Department’s special provision for Asbestos Containing Soils and comply with all federal, state, and local requirements pertaining to them.
- C. The Developer shall manage solid waste, hazardous waste, and hazardous materials in accordance with Article 16 of the Agreement, all applicable federal, state, and local environmental regulations and shall implement good housekeeping, waste minimization and pollution prevention practices.
- D. The Developer shall perform asbestos inspections on all structures (including bridge structures) and, as applicable, perform asbestos abatement, abatement monitoring, notifications and demolition in accordance with Department procedures and specifications. Prior to demolition, asbestos abatement shall be performed for all structures found to contain regulated asbestos materials (RACM) and non-RACM that is expected to become friable (i.e. RACM) during the course of demolition. The Developer shall make all appropriate abatement and demolition notifications as required by federal, state, and local regulations.
- E. Asbestos inspection, abatement and project monitoring shall be performed by individuals and firms licensed by the Virginia Department of Professional and Occupational Regulation. Asbestos abatements shall not be performed by an asbestos contractor who has an employee/employer relationship with, or financial interest in, the laboratory used for asbestos sample analysis nor shall the asbestos contractor have an employee or employer relationship with, or financial interest in, the asbestos inspector and project designer working on the

Project. Copies of all asbestos inspection, monitoring and disposal records shall be provided to the Department.

- F. For any asbestos waste and other non-hazardous waste, the Developer shall have the signatory responsibility for the waste shipping manifest(s) or bill(s) of lading. The Developer shall be considered the co-generator and arranger of Hazardous Substances in accordance with Article 16 of the Agreement and shall be responsible for preparing the hazardous waste shipping manifest(s) for the Department's signature and as otherwise consistent with the signatory requirement under Section 411 of the VDOT Road and Bridge Specifications.
- G. The Developer 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 Department prior to start of construction. In the event of spills or releases of petroleum products and other hazardous liquids or solid materials, the Developer 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 Developer shall notify the Department 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.
- H. The Developer shall not acquire property until any required Phase I Environmental Site Assessment is complete and approved by the Department. This shall represent a Hold Point in the Developer's CPM Schedule.

3.2.8 Air Quality

- A. 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 May 11, 2015, is provided in the RFP Information Package. The Report identifies federal and state regulatory requirements that must be adhered to during construction of the project.
- B. This Project is located within an 8-Hour Ozone Nonattainment area, an Annual Fine Particulate Matter (PM_{2.5}) Maintenance area, a Carbon Monoxide Maintenance area, and a volatile organic compounds (VOC) and nitrogen oxides (NO_x) Emission Control Area. As such, all reasonable precautions should be taken to limit the emissions of VOC, NO_x, and particulate matter 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 et seq., Open Burning restrictions; 9 VAC 5-45-Article 7 et seq., Cutback Asphalt restrictions; and 9 VAC 5-50, Article 1, et seq., Fugitive Dust precautions. The

Developer will be required to adhere to the limitations outlined in Special Provision 107E for Volatile Organic Compound Emissions Control Areas.

3.2.9 Noise Mitigation

- A. The Developer shall provide permanent noise mitigation in compliance with the State Noise Abatement Policy (SNAP) and the Highway Traffic Noise Impact Analysis Guidance Manual. The final barrier location(s) and dimension(s) will be determined during the final design noise analysis. A Noise Abatement Design Report (NADR) shall be furnished by the Developer at its sole cost and expense. The NADR, including the noise model, will be based on the Technical Concept Plans.
- B. The production of the Final NADR may consist of individual technical memorandums developed for one or more noise barriers to be submitted for review and approval as they are completed. Once all noise barrier technical memorandums are approved by the Department and the FHWA, the Final NADR can be compiled.
- C. The final noise mitigation design will use the specific environmental traffic data (ENTRADA) spreadsheets that were developed for the I-66 project with the appropriate future design year. The Developer shall be responsible for developing and updating the ENTRADA for the Final NADR based on the approved design and or latest design information. The future design year build traffic forecasts used in ENTRADA shall be based on the Preferred Alternative.
- D. Upon approval of the Final Design Noise Analysis the Department will prepare a concurrence letter outlining the results of the analysis for the Department and FHWA. Once concurrence is achieved the Developer shall prepare and mail letters “certified return receipt” to benefitted receptors.
- E. All sound barriers should be named as presented within the NADR.
- F. Prior to submitting a sound barrier plan for the Department’s review, the Developer 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.
- G. If deviations in the horizontal or vertical alignment of a sound barrier or the roadway alignment are proposed following concurrence from the Department and FHWA, then additional documentation will be provided with the plan set when the set is submitted to the Department for review. This will include a plan and profile view of the roadway with the alignments of the recommended barrier and the proposed design. A justification of the deviation will be included with the plan set. The revised NADR chapter for the sound barrier for which modification is requested will be submitted with this additional information.

- H. The Department's written approval of the barrier deviation will be required for the approval of AFC Documentation.
- I. A key plan will be clearly labelled to show the location of the ground-mounted combo wall (sound barrier on retaining wall) and bridge-mounted sound barriers.
- J. Plan view will provide the alignment of the sound barrier with the roadway plan view.
- K. 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.
- L. Stations of the roadway and sound barrier will be included on both the plan and profile views.
- M. Unless otherwise noted on the plans or approved by the Department, sound barrier walls shall be designed with a 10-foot wide maintenance area behind the walls with access for personnel and equipment. Access may be provided by access doors for personnel. Gaps may be provided in the walls with a 3:1 overlap to gap ratio. If the 10-foot wide maintenance area is unavailable, or requires support of excavation or right-of way acquisition, the 10-foot maintenance area dimension may be reduced to no less than one foot where demonstrated to be necessary with the approval of the Department.
- N. The area between the barrier and the sound barrier wall shall be designed to avoid debris accumulation.
- O. Sound barrier design will be coordinated with first responders to ensure access to fire hydrants and other emergency equipment, where feasible.
- P. Sound barrier design should periodically provide pedestrian and bicycle access to the shared use path along the north side of I-66. These access locations should provide adequate sight distance for bicyclists entering from the adjacent neighborhoods. These locations can be co-located with other access needs.
- Q. General notes that state the following will be included:
 - 1. "Sound barriers will be designed and constructed in accordance with the Special Provisions for Sound Barrier Walls included in Attachment 1.5. The barrier aesthetic treatment and color is defined in the Special Provisions.
 - 2. "Sound barriers will be designed and constructed in accordance with the roadway cross-sections in the plans."

3. “Sound barriers will be designed and constructed in accordance with the soil parameters included in the Geotechnical Report.”
 4. “Access door requirements and locations shall be determined prior to design as directed by the Department.” Door standard size shall be nominal 4 feet x 7 feet.
 5. “All sound barrier walls will have sound absorptive finish, unless otherwise noted.”
- R. The Developer shall construct the proposed sound barrier wall prior to demolishing an existing sound barrier wall unless otherwise approved by the Department. The Developer shall demonstrate that the new sound barrier wall cannot be constructed without first demolishing the existing sound barrier wall.
- S. If a proposed sound barrier wall cannot be constructed prior to demolishing an existing sound barrier wall, the Developer shall begin construction of new sound barrier walls within sixty (60) days of the start of demolition of an existing sound barrier wall or cutting of trees whichever occurs first, unless otherwise approved by the Department. The Developer shall complete construction of any new sound barrier wall intended to replace an existing sound barrier wall or trees which were acting as a screen for adjacent properties within 240 days from the start of demolition of the existing sound barrier wall or cutting of trees whichever occurs first, unless otherwise approved by the Department. Once work commences on an individual sound wall, the Developer shall continue construction operations until the wall is complete, unless otherwise approved by the Department.
- T. The Developer shall use the preliminary noise analysis to plan for and price the amount of sound barriers to be delivered as part of the Project. Following the Agreement Date, the Developer shall prepare a final noise analysis to support the Final NADR. The Final NADR will, among other things, help the Department to confirm the final amount of sound barriers to be delivered as part of the Project. Based on the results of the final noise analysis, one of the following scenarios may apply:
1. If the square foot quantity of noise walls constructed is less than the square foot quantity of sound barriers based on the linear feet of proposed noise walls shown on the RFP Conceptual Plans and to the heights indicated in the preliminary noise analysis, the Developer shall credit the Department for the amount of reduction.
 2. If the square foot quantity of sound barriers constructed is more than the square foot quantity of noise walls based on the linear feet of proposed noise walls shown on the RFP Conceptual Plans and to the heights indicated in the preliminary noise analysis, the Department will compensate the Developer for the amount of increase.

For both clauses above, the unit price of credit or compensation shall be as indicated at the time of bid, agreed to by the Department, and deemed all-inclusive.

- U. Early coordination with the National Park Service (NPS) has determined that the NPS does not want noise mitigation for the Manassas National Battlefield Park. As such, the Developer shall evaluate all noise sensitive receptors, including noise sensitive NPS receptors. However, noise mitigation does not need to be evaluated for the NPS noise sensitive receptors unless other noise sensitive receptors (e.g. residential receptors) in close proximity to the NPS noise sensitive receptors warrant the evaluation of noise mitigation.

3.2.10 Environmental Compliance

- A. The Developer is responsible for compliance with all applicable state and federal environmental laws, regulations, and permits. If, at any time, the Developer is not in compliance with all applicable environmental laws, regulations, Executive Orders, commitments, etc., the Department 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 Developer to bring the item(s) back into compliance.
- B. The Developer shall be responsible for any schedule delays and associated costs as a result of any delays or shut downs associated with non-compliance. Any monetary fines associated with violations or any environmental restoration activities required to resolve violations shall be the responsibility of the Developer.
- C. The Developer shall carry out environmental commitments during design and construction, as applicable, as identified in the EA, the Document Re-evaluations for RW Authorization (EQ-201) and PS&E Authorization (EQ-200), and the Environmental Certification and Commitments Checklist (EQ-103). Fulfilment of all commitment compliance shall be supported by appropriate documentation and provided by the Developer to the Department. The Developer shall implement a Project-wide tracking system to demonstrate compliance with all environmental commitments, and the tracking system shall be publically accessible via a web-based platform.
- D. The Developer shall be responsible for compliance with pre-construction and construction-related environmental commitments and permit conditions. The Developer 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 Developer.

3.3 Geotechnical

3.3.1 Geotechnical Design

- A. Geotechnical design engineer. This individual shall be responsible for ensuring that all geotechnical investigations, analysis and recommendations that are necessary for the design and construction of the Project are performed in accordance with the Technical Requirements. The geotechnical design engineer shall coordinate with the design manager to ensure that all geotechnical design and construction considerations have been properly considered in the design and included in the work plans, specifications, copied notes, and constructability reviews for the Project. This individual shall have geotechnical engineering experience and expertise working in the region and/or in areas of similar geologic settings with similar project features as this Project. The geotechnical design engineer shall be a Licensed Professional Engineer in the Commonwealth of Virginia and shall be present during construction on the Project site.
- B. The minimum soil parameters to be used for design of foundations for sound barrier walls, minor retaining walls (e.g., less than 15 feet in height) and for the design of non-critical slopes (e.g., less than 25 feet in feet) shall be in accordance with the standards and specifications set forth in Attachment 1.5.
- C. The Developer shall collect appropriate data for geotechnical evaluation of embankments, soil and rock cuts, culverts, pavements, bridge and wall structures, sound barrier walls, stormwater management facilities, minor structures including drainage pipes, and any other earth-supported structures or elements of highway design and construction. The Developer shall be responsible for obtaining any Regulatory Approvals required for any borings needed in performance of the Developer's geotechnical investigation for this Project. The Developer shall be responsible for obtaining all necessary permits and utility clearances as required by the Department, 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 Developer shall complete laboratory tests in accordance with pertinent ASTM or AASHTO standards and analyze the data to provide design and construction requirements. Soils and materials tests shall be performed by a laboratory accredited by AASHTO for each test it conducts for the Project, unless otherwise approved by the Department. The Developer shall have a geotechnical report approved by the Department before beginning construction.

- D. The Developer shall provide to the Department records of all subsurface explorations and describe the soils encountered and their depth limits, in accordance with the requirements outlined in Chapter 3 of the Department's *Manual of Instructions* for Materials Division and the investigation in accordance with an approved exploratory boring plan(s) approved by the Department. The Developer may elect to perform roadway borings at twice the spacing identified in Chapter III of the *Manual of Instructions* provided the Developer assumes all responsibility and liability for any changed or unknown conditions at the unexplored locations. All other (e.g., bridge, retaining wall, sound barrier wall, minor foundations, etc.) boring spacing requirements shall be in accordance with Chapter 3 of the *Manual of Instructions*.

For Mainline I-66 (Express Lanes and general purpose lanes) and loop/ramp widening to I-66, the Developer may elect to perform pavement cores at a maximum spacing of 2,000 feet in lieu of the maximum requirement listed in Standard WP-2, provided the Developer assumes all liability and risk for any changed or unknown conditions at the unexplored locations. Preliminary and final and design geotechnical investigations shall be performed to meet the minimum requirements set forth in Attachment 1.5. For preliminary bridge geotechnical reports, the Developer may elect to perform 50% of the borings required for the final investigation with a minimum of one (1) boring per substructure, provided the Developer assumes all liability and risk for any changed or unknown conditions at the unexplored locations.

The final geotechnical investigation shall be in compliance with Chapter 3 of the Department's *Materials Manual of Instructions*, the AASHTO LRFD *Bridge Design Specifications*, and VDOT Modifications; and Section 700.05 (c) of the VDOT Road and Bridge Specifications unless otherwise approved by the Department. The Developer may elect to use cores and borings included in the Geotechnical Engineering Data report performed for the Project to meet these requirements. The Developer shall provide electronic copies of all subsurface explorations in accordance with the boring log template available on the Website address included in Chapter 3 of the Department *Manual of Instructions* for Materials Division. The electronic files shall be provided by a certified Professional Geologist or a suitably qualified registered Professional Engineer in the State, in gINT© software, before the beginning of construction. Upon request, the Department will provide its gINT and ACCESS file structures for the Geotechnical Database Management System.

- E. Where applicable, the Developer shall incorporate reliability assessments in conjunction with standard analysis methods. 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. A suitable design will provide a probability of success equal to or greater than 99 percent. The aspects of this Project for which reliability assessments shall be

made include: 1) the selection of soil parameters used in the design of all foundations and retaining walls, 2) the factors of safety for slope stability, and 3) the settlement and bearing capacity of embankments. Except as mentioned in (1) above, reliability assessments need not be performed for structural foundations and retaining walls, which will be evaluated based on the required limit states in LRFD. The Developer 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. The Department may, in its sole discretion, accept or reject such proposed methods.

- F. The Developer shall provide to the Department geotechnical design and construction reports that summarize pertinent subsurface investigations, tests, and engineering evaluations in accordance with the requirements of Chapter III of the Materials Division Manual of Instructions. Technical specifications for construction methods that are not adequately addressed in the standards and specifications set forth in Attachment 1.5 shall be provided by the Developer. The Developer shall review the Construction Documentation to assure that they have appropriately incorporated the geotechnical components. The quality control-quality assurance documents shall document how each specific geotechnical recommendation or requirement is addressed in the Construction Documentation, and shall reference the drawings that incorporate the pertinent results. The results of the geotechnical investigation and laboratory results shall support the design and construction efforts to meet the requirements for the pavement design set forth in Attachments 1.5 and 3.7.
- G. The Developer shall minimize differential settlements of the approach to a bridge for new construction and when applicable provide construction recommendations to address soil-structure interaction to accommodate the unique construction methods applied to this Project. All geotechnical work shall be completed to satisfy baseline and post-construction contract performance requirements, as described below.
- H. Design and construct pavements, subgrades, and embankments to meet the following post-construction settlement tolerances:
 - 1. Total vertical and differential settlements that will not be a deterrent to achieve and maintain the post-construction performance requirements for overall ride quality and localized roughness of the pavements nor exceed the grade tolerances of pavement sections of approach slabs, bridge decks, and tie-ins to the Project;
 - 2. Settlement that will not impede positive drainage of the pavement surface especially within the travel lanes nor subject the roadway to flooding;

3. Settlement that does not result in damage to adjacent or underlying structures, including utilities; and
 4. Humps and depressions exceeding the specified tolerance will be subject to correction by the Developer. The Developer shall notify the quality assurance manager or the operation and maintenance manager and the Department for any non-conformance items.
- I. The Developer shall consider settlement and design foundations (bridges, retaining walls, pipes and other structures) based upon Attachment 3.3. In summary, Attachment 3.3 outlines two options for managing settlement of structures: (1) limit total settlement to .5 inch and subsequently limit the need for a refined analysis of the superstructure and substructure; or (2) allow the Developer to design the structure for its estimates of elastic, consolidation, and Secondary Settlement (total settlement) and subsequently communicate the total and differential settlement in a general note to the Design Documentation. In either case, a general note shall be placed on the Design Documentation which communicates the amount of settlement evaluated and accommodated by the structure. Specific general note language, along with notes to the designer, are set forth in Attachment 3.3.

3.3.2 Slope Design

Cut and fill slopes shall be no steeper than 2H:1V. All cut and fill slopes shall be designed to be stable for the interim construction stages, for the end-of-construction condition, and for design-life conditions.

The following factors of safety are to be used with limit equilibrium methods of analysis to identify factors of safety for representative sections of all soil cut and soil embankment fill slope areas higher than 10 feet, or where slopes are supporting on, or are supported by, retaining structures. The factors of safety listed in Table 3.3 are valid for subsurface investigations performed in accordance with Chapter III of the Department's Materials Division's *Manual of Instructions* or for site-specific investigation plans approved by the Department. Table 3.3 is not applicable for rock cut slopes.

Table 3.3 Minimum Factors of Safety for Soil Cut/Fill Slopes		
Basis of Soil Slope Analysis Parameters	Factor of Safety	
	Involves Structure or Critical Slope	Non-Critical Slope
In-situ or lab tests and measurements ^{2,3}	1.5	1.3
No site specific tests	N/A ³	1.5
1. A critical slope is defined as any slope that is greater than 25 feet in height, affects or supports a structure, or whose failure would result in significant cost for repair, or damage to, private property 2. Site specific in-situ tests include both groundwater measurements and SPT testing but may also include CPT or DMT 3. Parameters for critical slopes involving structures must be based on specific laboratory testing 4. Problem soils (fissured or heavily over-consolidated soils), must be analyzed using shear strength parameters determined from appropriate laboratory strength tests 5. Problem soils must be analyzed for short- and long-term stability using residual strength parameters obtained from laboratory shear testing. These parameters must be determined by drained direct shear tests using sufficient stress reversals to obtain large strains as discussed in the U.S. Army 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). 6. Construction plans shall specify use of soil types consistent with the parameters used in slope analyses		

Global and slope stability analyses of Potomac Formation clay and silts shall be analyzed using residual strength parameters for problem soils wherever they are encountered.

3.3.3 Unsuitable Materials

Unsuitable Material is defined as material used as embankment fill, and in cut areas to a depth of at least 3 feet below subgrade directly beneath pavements and at least 2 feet beneath the bedding of minor structures and laterally at least 3 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 5 percent by weight organic matter; exhibits a California Bearing Ratio (CBR) value less than 5 when tested in accordance with VTM-8; exhibits a swell greater than 5 percent as determined from the CBR test using VTM-8; exhibits strength, consolidation, durability of rock or any other characteristics that are deemed unsuitable by the Developer’s geotechnical engineer or as denoted in the Agreement for use in the Work. All materials within the uppermost 3 feet of a pavement subgrade that exhibits a CBR value less than that stipulated in the pavement design shall also be considered unsuitable except beneath the existing

pavement where the Developer is restricted from disturbing existing subgrade soils.

The anticipated locations and methods of treatment for unsuitable materials identified by the Developer's qualified geotechnical engineer shall be shown on the design plans and cross sections. Saturated or very dry 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 treated as discussed in accordance with the Agreement 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 12 inches.

Acceptable methods of dealing with these unsuitable soils are: 1) 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; 2) partial removal to at least 2 feet below final pavement subgrade or minor structure bedding elevation to within the limits noted in 1) and replacement with select material per Section 207 of the Road and Bridge Specifications and geosynthetic fabric; 3) raising grades with select material per Section 207 of the Road and Bridge Specifications and geosynthetic fabric to provide a minimum 2 feet of separation between these soils and final pavement subgrade or minor structure bedding, and 4) chemical stabilization of the soils to a minimum depth of 12 inches below final pavement subgrade. All unsuitable materials shall be disposed off-site at no additional cost to the Department.

3.3.4 Embankments and Retaining Walls

Embankments and certain aspects of retaining wall design are not addressed by LRFD. Embankments and cut slopes shall be designed in accordance with VDOT Materials Division's MOI. The maximum slope ratio to be used for cut or roadway embankment fill slopes shall not be steeper than 2H:1V. The Developer is responsible for verifying the stability of all slopes, including those retained by structures.

All retaining walls shall be designed in accordance with the applicable Department and AASHTO requirements, including Soil Design Parameters for Sound Barrier Walls, Retaining Walls and Non-Critical Slopes included in Attachment 1.5. If the Developer 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 the VDOT Special Provisions for approved proprietary MSE

walls. The Developer shall provide both global and external stability analysis utilizing a computer program acceptable to the Department and submit the results of the analysis, including boring logs, laboratory data, and any other applicable data, to the Department for review. The wall supplier shall provide to the Developer, for submittal to the Department, 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 the VDOT Manual of the Structure and Bridge Division, Volume V – Part 11 “Geotechnical Manual for Structures” and applicable special provisions listed in Attachment 1.5. Where undercutting and material replacement is required to reduce settlement or improve bearing capacity and global stability, areas requiring repair shall be clearly identified on the plans with notes provided to aid plan review, construction, and inspection.

3.4 Materials

3.4.1 Rights for and Use of Materials Found on Project

With approval of the Department, the Developer may use in the Project any materials found in the excavation that comply with the standards and specifications set forth in Attachment 1.5. The Developer shall replace unsuitable materials at its own expense with acceptable material. The Developer shall not excavate or remove any material from within the construction limits that is not within the grading limits, as indicated by the slope and grade lines. **The Developer shall not waste, bury, deposit, or abandon any material within the Project limits.** The Department may consider at its sole discretion certain exceptions to this requirement on a “case-by-case basis.”

3.4.2 Samples, Tests, and Cited Specifications

The responsibility for quality control, quality assurance, and ensuring compliance with applicable specifications and testing requirements lies with the Developer. The Developer’s QMSP shall outline the procedures for quality assurance, quality control, and compliance with the Technical Requirements. The Department, at its discretion, may conduct testing and audits in its performance of Oversight Services.

3.4.3 Disposal Areas

- A. **Unsuitable or surplus material shall be disposed of by the Developer off the Project ROW.** The Developer shall obtain the necessary rights to property to be used as an approved disposal area. An approved disposal area is defined as that which is owned privately, not operated under a local or State permit and has been approved by the Department for use in disposing of unsuitable or surplus material.

- B. Prior to the Department approving a disposal area, the Developer shall submit a site plan. The plan shall show:
1. The location and approximate boundaries of the disposal area;
 2. Procedures to minimize erosion and siltation;
 3. Provision of environmentally compatible screening;
 4. Restoration;
 5. Cover vegetation;
 6. Other use of the disposal site;
 7. The drainage pattern on and away from the area of land affected, including the directional flow of water and a certification with appropriate calculations that verify all receiving channels are in compliance with Minimum Standard 19 of the Virginia Erosion and Sediment Control Regulations;
 8. Location of haul roads and stabilized construction entrances if construction equipment will enter a paved roadway;
 9. Constructed or natural waterways used for discharge;
 10. A sequence and schedule to achieve the approved plan; and
 11. The total drainage area for temporary sediment traps and basins shall be shown. Sediment traps are required if the runoff from a watershed area of less than 3 acres flows across a disturbed area. Sediment basins are required if the runoff from a watershed area of 3 acres or more flows across a disturbed area. The Developer shall certify that the sediment trap or basin design is in compliance with the standards and specifications set forth in Attachment 1.5. Once a sediment trap or basin is constructed, the dam and all outfall areas shall be immediately stabilized.
- C. Disposal areas shall be cleared but need not be grubbed. The clearing work shall not damage grass, shrubs, or vegetation outside the limits of the approved area and haul roads thereto. After the material has been deposited, the area shall be shaped to minimize erosion and siltation of nearby streams and landscaped in accordance with the approved plan for such work or shall be used as approved by the Department. The Developer's design and restoration shall conform to the requirements of the Agreement.
- D. The Developer shall furnish the Department a statement signed by the property owner in which the owner agrees to the use of their property for the deposit of

material from the Project. The property owner will hold harmless the Department, its officer, its agents, and its employees. Upon completion of the use of the property as an approved disposal area, the Developer shall furnish the Department a release signed by the property owner indicating that the property has been satisfactorily restored. This requirement will be waived for commercial sources, sources owned by the Developer, and sources furnished by the Department.

- E. The Developer will obtain VPDES Construction Permit as well as any other applicable permits for Disposal Site, which shall be in compliance with Department standards and specifications.

3.5 Drainage

3.5.1 Drainage Analysis and Design Report

The drainage system analysis and design work shall include, at a minimum, the design and construction of culverts, cross drains, ditches, open channels, storm sewer systems, underdrains, bridge deck drainage assemblies and structures, downstream channel and flood protection measures, stormwater management facilities, and erosion and sediment control measures in compliance with the standards and specifications set forth in Attachment 1.5 and the VDOT Erosion and Sediment Control and Stormwater Management Programs. The Developer shall provide the Department 2 paper and 2 electronic copies 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. Each milestone submission of drainage analysis shall include 2 paper and 2 electronic copies of the drainage report for the Department's approval.

3.5.2 Drainage Design and Plan Documentation

The Developer shall provide and 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 Attachment 1.5.

Final Design Documentation for any hydraulic design shall include a complete set of final drainage computations sealed and signed in accordance with IIM-243.

- A. The drainage design shall include but not be limited to enclosed storm sewer systems, inlets, stormwater management systems for water quality and water quantity, manholes, junction boxes, conduits, culverts, headwalls, end sections,

channels, ditches, bridge and major structure hydraulics, scour analysis, scour countermeasures, adequate outfalls, and erosion and sediment control.

- B. The Developer shall prepare drainage design criteria and a list of software packages to be used in the design sixty (60) days prior to the first drainage submission for review and acceptance.
- C. The Developer shall assemble and review all available data, studies, and development plans impacting the Project for use in preparing the drainage design. The Developer shall perform a hydrologic analysis of the Project corridor and all off-site areas that drain through or impact the Project.
- D. The Developer may elect to use existing Department drainage assets hydraulically throughout the Project for its drainage design. If the Developer elects to use Department drainage assets for its hydraulic design, the Developer shall evaluate the drainage assets for hydraulic adequacy. The Developer shall perform all hydraulic improvements necessary to bring the existing drainage assets into hydraulic compliance. All existing drainage assets the Developer intends to use shall be evaluated and verified to have adequate hydraulic capacity for ultimate land use conditions in accordance with the VDOT Drainage Manual.

Existing drainage assets used by the Developer for its drainage design shall be evaluated for structural adequacy. The Developer shall extend or modify all existing drainage assets as required to accommodate the drainage design. If existing drainage assets will be subjected to any additional loading, the Developer shall make all improvements as necessary to achieve structural adequacy. If there is an existing drainage Asset the Developer elects to use, but is prevented from doing so because of physical damage to the existing drainage Asset, the Developer shall repair or replace the existing drainage Asset in the immediate area of the proposed connection. The Developer shall repair or replace any existing drainage Asset used in the drainage design in the Project ROW that is structurally deficient.

- E. The Department has provided to the Developer the current inspection reports of all existing large culverts for the Project which indicate the structural adequacy of those assets. Existing drainage assets determined not to be needed for the Developer's drainage design, and no longer needed by the Department, shall be abandoned in place or removed by the Developer.

The Developer shall assess the structural condition of the assets by performing a visual and video inspection of the existing non-bridge class pipes and culverts utilizing the assessment criteria for Post Installation Inspections presented in VDOT Supplemental Specification 302. The Developer shall provide the Department with an inspection report documenting their assessment following the methodology as prescribed in the supplemental specification. The report

shall include specific recommendations relative to the structural condition and serviceability of the structures. With the Department's approval, drainage pipes and box culverts deemed repairable shall be rehabilitated in accordance with the Department's guidelines including, but not limited to those methods outlined in Chapter 8, of the VDOT Drainage Manual and Special Provisions SU302001B Pipe Rehabilitation and SU302002A Pipe Replacement.

- F. The Developer shall provide new stormwater management facilities as required by the Project in accordance with applicable standards and specifications set forth in Attachment 1.5. In addition, any existing stormwater management facilities that may need to be removed or impacted as a result of the Project shall be replaced or retrofitted by the Developer in accordance with applicable standards and specifications set forth in Attachment 1.5.
- G. No drainage grate inlet, manhole, or at-grade drainage structure shall be placed or extended within the travel way of the Interstate, the associated Interstate ramps, or collector roadway, unless otherwise approved by the Department.
- H. The Developer shall be required to clean out debris accumulations and silt in all drainage facilities in the Project ROW prior to Project Completion.
- I. The foregoing provision shall not apply if the hydraulic capacity or structural loading of any existing drainage Asset is verified to be inadequate, as determined pursuant to the Agreement, as a result of the Developer proposed tie-in or connection. In that case, the Developer shall, at its sole cost and expense, replace, repair, or otherwise upgrade the existing drainage Asset (in accordance with the standards and specifications set forth in Attachment 1.5) in order to accommodate the proposed tie-in or connection.
- J. See Structures and Bridge section for bridge deck drainage requirements.
- K. For all impacted permanent structures and bridges, the hydrology, hydraulics, and scour requirements shall be in accordance with the requirements set forth in Attachment 1.5, including but not limited to AASHTO Load and Resistance Factor Bridge Design Specifications (the more stringent requirements shall govern).
- L. The Developer shall perform a comprehensive design analysis for impacted major culvert or bridge-crossing locations where the 100-year discharge is 500 cfs or more, or floodplain studies have been published by federal agencies. The outline for the comprehensive design analysis will be in accordance with the standards and specifications set forth in Attachment 1.5. The Developer will ensure the hydraulic analysis is coordinated with the bridge design when bridges over waterways are involved.
- M. The scour analysis and reporting shall be in accordance with the standards and specifications set forth in Attachment 1.5 and shall include all existing

structures undergoing restoration of structural integrity, widening, and new and replacement bridges at stream crossings. Countermeasures to accommodate scour at existing piers shall only be used when approved by the Department. Scour countermeasures shall be provided at existing and new abutments in accordance with the standards and specification as set forth in Attachment 1.5.

- N. The Developer shall perform a scour analysis on all new retaining walls parallel to stream flow or subject to longitudinal scour. Retaining walls subject to longitudinal scour will be designed to withstand the 500-year super flood scour without the aid of scour countermeasures, unless otherwise agreed by the Department. Appropriate bank protections and revetments are required for walls subject to flows and potential bank erosion.
- O. During the Work period the Developer shall provide for positive drainage of all roadway facilities. Construction activities shall not redirect or add drainage runoff to a private property.
- P. All drainage pipes and structures within the limits of the possible future Metrorail or other transit area shall be designed and constructed to accommodate the rail facilities and the structural design loads of the future railroad tracks and rail vehicles requirements documented with the standards and specifications set forth in Attachment 1.5.

3.5.3 Underdrain outfall locations are not shown in the RFP Conceptual Plans and it shall be the responsibility of the Developer to develop the underdrain design including adequate outfall locations. The Developer may, at its discretion, use 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 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.

3.5.4 Stormwater Pollution Prevention Plan (SWPPP)

- A. 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 Developer in compliance with applicable requirements of the standards and reference documents listed in Attachment 1.5 including the Virginia Erosion and Sediment Control Law and Regulations and the Virginia Stormwater Management Program (VSMP) Law and Regulations.
- B. It shall be the responsibility of the Developer 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 Department of Environmental Quality (DEQ) 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 the Department and DEQ Approved ESC

and SWM Standards and Specifications. Before implementing any ESC or post construction SWM measures not included in the VDOT approved ESC and SWM Standards and Specifications, a variance or exception respectively must be requested through the Department in accordance with the latest versions of IIM-LD-195, IIM-LD-242 and the VDOT Drainage Manual.

- C. The Developer shall complete and submit the ESC and SWM Plan Certification form (LD-445C) to the Department. The Developer shall provide the Department 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 to demonstrate compliance with the applicable stormwater management regulations. 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.
- D. For Projects Requiring VPDES Coverage (Total land disturbance \geq 1 Acre)

1. The Project requires coverage under the VPDES General Construction Permit for the Discharges from Construction Activities (VPDES Construction Permit). The Developer is responsible for providing to the Department the necessary information needed to secure permit coverage for the Project. Upon review and acceptance, the Department will provide a certification statement to VA DEQ that the ESC and SWM plans are in accordance with applicable standards and specifications in Attachment 1.5, which will serve as the plan review for purposes of permitting.

The Developer shall be responsible for all fees necessary for coverage under the VPDES General Construction Permit. The Developer shall be responsible for acquiring VPDES Construction General Permit coverage and letter directly from VA DEQ.

The Developer shall also complete the applicable sections of the VPDES Construction Permit Registration Statement per VA DEQ format, VPDES Construction Permit Contact Information (LD-445A). These forms shall be submitted to the Department. The Department will review the submitted information and, if complete and acceptable, process a request for release of construction work in accordance with the Department's guidelines as outlined in the latest version of IIM-LD-242. If any information submitted by the Developer is found to be incomplete or unacceptable, the assembly will be returned to the Developer for corrective action and resubmission.

2. A working conceptual ESC and conceptual SWM Plan, with preliminary calculations and nutrient removal requirements, and SWPPP for the entire

Project must be submitted for review and approval with the initial application for permit coverage. This initial 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 Developer 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 conditions 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 Developer shall not proceed with work to be covered by the permit until permit coverage is secured and the Department releases the work in writing. It is noted that release of work, can take up to ninety (90) days from the time that the Developer submits a request for coverage that includes all required information. This represents a Hold Point in the Developer's CPM Schedule.

The Developer shall provide a completed SWPPP Certification form (LD-455E) before commencement of any land disturbing activity and shall complete and include the SWPPP General Information Sheets in the plan assembly in accordance with the VDOT Drainage Manual. The SWPPP Certification form (LD-455E) and SWPPP General Information Sheets shall be updated with each work segment submittal as necessary.

3. The Developer 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 Developer. Upon completion of the entire regulated land disturbing activity (including final stabilization of all disturbed areas), the Developer shall provide updated and 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 to the Department. The Developer shall process VPDES Construction Permit termination from VA DEQ by completion of Notice of Termination form per VA DEQ format. In addition to Deputy QAM for Environmental Compliance, the Developer shall also have on-site during any land disturbing operations an individual or individuals holding a DEQ Inspector Certification, a DEQ Responsible Land Disturber (RLD) Certification, a

VDOT Erosion and Sediment Control Contractor Certification (ESCCC), and DEQ SWM Inspector certification to ensure compliance with all DEQ and the Department erosion and sediment control and stormwater management plan implementation requirements.

4. Underground stormwater management systems or vaults shall not be placed under the I-66 roadway.
5. Permanent stormwater management facilities shall not be placed within the median area of the I-66 roadway.

3.5.5 Post-Construction Stormwater Management Facilities

- A. The Developer shall be responsible for the design and construction of stormwater management facilities as required for the Project in accordance with the Part IIC technical criteria of the Virginia Stormwater Management Program Law and Regulations, the latest version of IIM-LD-195, and the other standards and reference documents listed in Attachment 1.5 including the Virginia Stormwater Management Program Law and Regulations. The Department 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 Developer, as part of their final design, shall evaluate these locations, and if found acceptable, develop a final post construction stormwater management plan. The Developer shall make reasonable efforts to locate stormwater management facilities within the Department ROW and to minimize impacts to surrounding communities.
- B. If any of the locations are found to be unacceptable, the Developer must identify other acceptable location(s) to meet the post construction stormwater management requirements of the Project. The Developer is to ensure proper ingress and egress to any stormwater management facility and specific proprietary facilities have proper maintenance details included in the as-built plans. When a stormwater management basin is located outside limited access fencing, maintenance access should be provided from a separate public road where economically feasible. When maintenance access can only be provided from a limited access roadway, a locked gate shall be provided. The Developer, as part of their final design, shall minimize impacts to existing tree space to provide a buffer between proposed SWM facilities and adjacent properties. If the Developer elects to use off-site treatment through participation in a local watershed comprehensive stormwater management plan, coordination between the Developer and applicable localities will be facilitated through the Department. The Developer shall verify feasibility of use of existing or proposed regional facilities with applicable localities and shall be responsible for all cost, schedule impacts, and legal implications thereof.

- C. The Department will make available a maximum of 102.3 pounds per year of phosphorous credits to meet up to 25% of the Project's phosphorous removal requirements as prescribed in IIM-LD-251. If the Developer determines that additional phosphorus reduction is required, the Developer will provide for and include the required compensatory mitigation in the post construction SWM Plan. The Developer shall account for all cost associated with the post construction Stormwater Management Plan, as well as additional compensatory mitigation above the 102.3 pounds provided, in its price proposal.

The Developer may elect to purchase additional nutrient credits, above the 102.3 pounds per year, to satisfy up to 25% of the post-construction water quality reduction requirements for the Project. It is the responsibility of the Developer to investigate the availability of nutrient credits and as such their purchase shall be at their risk. All costs associated with the purchase of additional nutrient credits shall be included in the Developer's price proposal. The use of nutrient credits shall be identified in the Developer's SWPPP. Where the Developer elects to purchase nutrient credits, the Developer shall complete Attachment 3.5, the Nutrient Credit Assignment Agreement and shall submit the agreement to the Department for execution. The agreement is to be used for the transfer of the ownership of additional nutrient credits from the purchaser to the Department. The agreement is to be completed with the appropriate project specific information and a copy of the bill of sale between the Nutrient Credit Bank and the purchaser is to be attached to the Agreement. A copy of the executed agreement is to be included with the BMP information submitted with the VPDES Construction Permit Termination form LD-445D.

3.5.6 Other Drainage Requirements

- A. All drainage facilities (existing and newly constructed) 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 Developer, as such maintaining the original line and grade, hydraulic capacity or construction of the facility prior to Project Completion.
- B. An assessment of the serviceable condition (cleanness) of the existing drainage structures located within the Project limits should be conducted prior to the commencement of any land disturbing activities by the Developer and provided to the Department project manager. The Developer shall be responsible for cleaning the existing drainage facilities that the Developer intends to tie into or otherwise impact, the degree of impact notwithstanding. The Developer is also responsible for cleaning any existing drainage facilities to be maintained by them in the future. The Developer shall not be responsible for cleaning existing drainage facilities that will be maintained by the Department and is not impacted by the Developer.

- C. During construction and maintenance of traffic stages there may be locations and situations which will require the installation of temporary structures to convey stormwater off the travel lanes. The following temporary drainage criteria related to allowable spread shall be implemented during construction:
- The intensity used to compute spread will be 4.0 inches per hour.
 - 25 percent clogging should be considered for the slot opening in the drainage computations.
 - Gaps or breaks of the barrier will be provided in the area where the computed spread reaches the allowable spread.
 - In sump areas where the only outlet for roadway drainage is through the inlet, the structure should be designed using the standard drainage criteria.
- D. The Developer shall be responsible for maintaining the new and any existing stormwater management BMPs that are impacted by the Project during construction per the Department, VA DEQ, and manufacturer's (for proprietary products) maintenance guidelines.

3.5.7 Scour

- A. The Developer shall be required to conduct scour analysis in accordance to FHWA, "Evaluating Scour at Bridges – HEC 18 (current version)," and "Bridge Scour and Stream Instability Countermeasures – HEC 23 (current version)." Other procedures can also be considered during the scour evaluation upon prior approval by the Department. The Department may, in its sole discretion, accept or reject such proposed procedures.
- B. All aspects related to scour elevations (including, but not limited to, shoring modifications, impacts to the maintenance of traffic, and utility conflicts) shall be included in the proposed price. All scour elevation shall be approved by the Department. The Developer shall be responsible for the final design and construction of the foundations for this Project, including the final Hydrologic and Hydraulic Analysis and the final Scour Analysis, in accordance with the Agreement.

3.5.8 Pipe Installation Methods

Culverts or utility pipes shall be installed by conventional methods, micro-tunneling operation, or jack and bore in accordance with the VDOT Road and Bridge Specifications and the applicable special provisions in Attachment 1.5. Trenchless technology other than these methods of installation is not permitted unless otherwise approved by the Department. The Developer 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 Developer 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 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 the VDOT Road and Bridge Specifications and the Special Provisions for jack and bore or micro-tunneling, as applicable.

3.5.9 Hydrologic and Hydraulic Analysis (H&HA)

- A. An H&HA, including scour analysis shall be completed for bridges over waterways and major culvert crossings that have a total 100-year design discharge greater than 500 cfs. The Developer shall deliver to the Department a final H&HA, including scour analysis for proposed major drainage structures. These analyses shall be submitted to the Department for review and approval prior to the commencement of construction. The H&HA shall include an established level of construction tolerance to allow for the hydraulic performance established in the H&HA to be maintained. The approval of the H&HA represents a Hold Point in the Developer's CPM Schedule. 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 Developer to meet all applicable hydraulic requirements, including current Federal Emergency Management Administration (FEMA), FHWA, AASHTO, and the Department guidelines as described in the VDOT Drainage Manual, VDOT Manuals of the Structure and Bridge Division, and applicable IIMs.
- B. Natural stream design, bank hardening, and revetments will be considered as part of the hydraulic design to minimize downstream impacts in accordance with state and federal requirements applicable to the Project. Natural stream design, bank hardening and revetments shall be designed in accordance with acceptable FHWA Publications. Acceptable FHWA publications include, but are not limited to, HDS-6, HDS-07, HEC-14, HEC-18, HEC-20, and HEC-23.
- C. The hydrologic and hydraulic analysis shall be documented by the completed VDOT LD-293 forms. The Developer shall provide the Department 2 paper and 2 electronic copies (sealed Adobe PDF format) of the final H&HA, HEC-HMS, HEC-RAS (or other the Department approved analysis software for this project)

Files and LD-293 on compact disc (CD). The final H&HA submittal is to include the completed VDOT form LD-450.

3.6 Roadway Design

3.6.1 General Requirements

Developer will prepare the final geometric design of the roadway elements in accordance with the standards and specifications set forth in Attachment 1.5. The specific design criteria for the Project shall be submitted to the Department for review and approval, as required in Attachment 1.3. Functional classifications for roadways and design speeds are provided in Attachment 3.6 as a basis for the specific design criteria to be submitted by the Developer. The specific design criteria shall follow the standards and specifications set forth in Attachment 1.5 unless a design exception or design waiver is approved.

- A. The Project design speeds for all facilities shall meet or exceed the minimum design speeds as shown in Attachment 3.6. The existing posted speeds are to remain the same on all existing facilities. The posted speed for the I-66 Express Lanes shall be 65 mph.
- B. In order to preclude toll violations and wrong-way access, the Developer will provide a continuous physical barrier system throughout the corridor. Bollards may be used as continuous physical barriers. The Department will have the final approval on the location and type of such barrier system.
- C. The project shall not include at-grade slip ramps between the general purpose lanes and the Express Lanes except as shown in the RFP Conceptual Plans.
- D. The Developer may reduce the outside shoulders of I-66 for the entire length of the project from the proposed width of 14 feet shown in the RFP Conceptual Plans to a typical minimum width of 12 feet. In locations adjacent to a barrier, a Design Waiver, submitted by the Developer, will be required for the reduced width of the outside shoulder.
- E. The Developer shall use Type I (Re-directive Low-Maintenance) impact attenuators, as approved by the Department, at applicable interchanges and ramps within the Project to absorb crash impacts and reduce impact force and risk of injury to vehicle occupants.

3.6.2 Developer Responsibility

The Developer is responsible for the design of the Project and the Developer will furnish the design of the Project, regardless of the fact that the RFP Conceptual Plans has been provided to the Developer as a preliminary basis for Developer's design. The Developer specifically acknowledges and agrees that:

- A. Developer is not entitled to rely on 1) the RFP Conceptual Plans, 2) the Reference Documents, or 3) any other documents or information provided by the Department, except as permitted in the Agreement.
- B. Developer is responsible for verifying all calculations contained in the RFP Conceptual Plans or otherwise provided by the Department.

3.6.3 Conceptual Design

The Developer acknowledges and agrees that if Developer chooses to deviate from the conceptual ROW contained in the RFP Conceptual Plans and approved ATCs, the Developer shall identify such deviations in writing to the Department, provide justification for the modification, and obtain specific written approval from the Department, in its sole discretion, prior to use of such modifications. The Developer must obtain the Department's prior written approval to deviate from the RFP Conceptual Plans and approved ATCs unless the proposed Deviation is 1) within the conceptual ROW and requires no additional right-of-way; 2) meets the requirements of the Technical Requirements; 3) requires no new environmental approval; and 4) does not constitute a Design Exception or Design Waiver. The Developer acknowledges and agrees that the requirements and constraints set forth in the Agreement and in the Governmental Approvals, as well as site conditions, will impact the Developer's ability to revise the concepts contained in the RFP Conceptual Plans and approved ATCs, in addition to the requirement to obtain approval. Notwithstanding anything to the contrary herein, if the Developer fails to obtain a required third party approval for an ATC, the Developer will be required to comply with the original requirements of the RFP without additional cost or extension of time as set forth in the Agreement.

3.6.4 Disclaimer

- A. The Developer understands and agrees that the Department shall not be responsible or liable in any respect for any Losses whatsoever suffered by any Developer by reason of any use of any information contained in the RFP Conceptual Plans or Technical Requirements. The Developer further acknowledges and agrees that 1) if and to the extent the Developer or anyone on the Developer's behalf uses any of said information in any way, such use is made on the basis that the Developer, not the Department, has approved and is responsible for said information, and 2) the Developer is capable of conducting and obligated hereunder to conduct any and all studies, analyses and investigations as it deems advisable to verify or supplement said information, and that any use of said information is entirely at the Developer's own risk and at its own discretion.
- B. The Department does not represent or warrant that the information contained in the RFP Conceptual Plans or Technical Requirements is either complete or accurate—including with respect to 1) the existence or need for bridges; 2)

bridge lengths, locations, and types depicted in the RFP Conceptual Plans; 3) the existence or need for retaining walls; 4) retaining wall heights, lengths, or sizes depicted in the RFP Conceptual Plans; or 5) any failure or omission to depict any of the foregoing in the RFP Conceptual Plans—or that such information is in conformity with the requirements of the Department provided approvals or other Agreement. The Department does not represent or warrant the accuracy or completeness of any itemized list set forth in the Technical Requirements. The foregoing shall in no way affect the Department’s liability for necessary basic configuration changes as specified herein.

3.6.5 Requirements for Operational Analysis

The Developer shall provide an operational analysis for any changes to the I-66 HOV/Express Lanes design as presented in the Design Public Hearing that require an amendment to the I-66 Express Lanes Interchange Justification Report.

The operational analysis shall demonstrate that the Developer’s revised design does not have a significant adverse impact on the safety and operation of the facility based on an analysis of current and future traffic, for design years 2025 and 2040, and based upon traffic counts provided by the Department and supplemented by the Developer as necessary. Traffic and operational analysis shall conform to the requirements of IIM-LD-200 *Development of Justification for Additional or Revised Access Points: Creation of Interchange Justification/Modification Reports*.

3.7 Pavement

Pavements shall be designed and constructed to meet or exceed the minimum pavement section requirements set forth in Attachment 3.7 and as specifically detailed in “VDOT Requirements for Geotechnical Investigation, Geotechnical Design and Minimum Pavement Sections for the Express Lanes.” Any changes to the specified minimum pavement sections or location for the pavement sections shown on the RFP Conceptual Plans require approval by the Department. Acceptable changes to the minimum pavement sections for the general purpose lanes are limited to increasing the specified thickness of the base or subbase layers. The Developer shall be responsible for the final design and construction of the pavements for this Project. Pavement design and construction shall meet the requirements of the federal pavement policy, 23 CFR 626 (Chapter 1).

3.7.1 General

- A. The general intent of this project is to salvage the existing Mainline pavement and full strength shoulders where they exist between the western limits of the project and US 29 in Centreville by widening and building up the existing pavement. Between US 29 in Centreville and the Capital Beltway, the intent is to remove the existing concrete and composite pavements to expose the existing subbase or stabilized subgrade layers. The native soils shall not be exposed where existing pavement layers are being salvaged. Any exposure of the

existing subgrade soils (excluding cement stabilized subgrade) will require additional SWM treatment. The Developer shall take particular care not to damage the existing cement stabilized base or cement stabilized subgrade during removal of the existing concrete pavements. Therefore, removal means and methods shall be limited to non-impact and non-vibratory means such as saw-cutting and lifting of existing slabs.

- B. All widening of the existing pavements shall be accomplished in accordance with Standard WP-2 so that the proposed widening pavement layers match the existing pavement layers in types and thicknesses) prior to building up or placing the surface course except as modified by Attachment 3.7. All existing pavement shall be saw-cut to a smooth vertical face a minimum of one foot inside the existing edge of full strength pavement in all widening areas. Widening of existing pavement shall provide for lateral drainage of the existing pavement layers by providing a free-draining aggregate (such as 21B) on the low side of the pavement cross-slope connected to a standard UD-4 edgedrain placed beneath the outside edge of the paved shoulder. All open-graded drainage layer (OGDL) shall be connected to a standard UD-4 edgedrain on the low side of the pavement cross slope. Where barriers are proposed, the paved shoulder shall be paved up to the proposed barrier in accordance with VDOT standard detail GR-INS. An impervious base/subbase (such as CTA) shall be provided for widening on the high side of existing pavement cross-slopes. The following note shall be added to the construction plans: The Department shall be notified as soon as the pavement saw-cuts are complete but no less than 48 hours prior to subbase/base placement in the widening areas.” All existing pavement shall be milled to a depth of 2 inches and resurfaced up to the nearest longitudinal lane divide wherever pavement markings will be eradicated or snow plowable raised pavement markers are removed. From Station 5248+00 to Station 5743+00, in addition to meeting the minimum milling requirements in Attachment 3.7, the Developer shall mill and overlay up to 5” of the existing pavement where the cracks are deeper than 1.5” or implement alternative pre-overlay repair techniques in agreement with AASHTO 1993.
- C. Department guidelines specify that edgedrains and underdrains be provided for pavement with daily traffic volumes in excess of 1,000 vehicles per day. Therefore, edgedrains and underdrains will be required for all pavements on this project. Modified UD-1 underdrain shall be provided in lieu of standard UD-4 for pavement subdrainage in wet areas, areas of high groundwater, springs and in cuts in excess of 25 feet; the modification consists of wrapping the aggregate with geotextile drainage fabric. Standard Combination Underdrain (CD-1) shall be provided at the lower ends of cuts. Standard Combination Underdrain (CD-2) shall be provided at grade sags, bridge approaches and at the lower ends of undercut areas. Standard UD-2 shall be installed beneath all raised grass median strips (MS-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.

- D. Any pavement reconstruction on arterials or local streets not specifically included in the VDOT Requirements for Geotechnical Investigation, Geotechnical Design and Minimum Pavement Sections for I-66 Corridor Improvements from US 15 to I-495 shall be designed to meet the design- year traffic and match the existing pavement type at tie-in in accordance with standard WP-2 and in accordance with the Department's pavement design standards and guidelines.
- E. The final pavement surface on all Mainline interstate pavement shall meet the requirements for rideability detailed in Attachment 1.5, specifically the Special Provision for Rideability.
- F. As an alternative to flexible pavement the Developer may design and construct rigid pavement using Continuously Reinforced Concrete Pavement (CRCP). Rigid pavement shall be designed and constructed to meet or exceed the minimum pavement requirements set forth in Attachment 3.7.
- G. For Express Lane Ramps and Mainline Express Lanes that will be maintained by the Developer, the Developer may elect to design an alternate pavement section. All alternate pavement sections shall be designed in accordance with these contract documents. Existing ramps that are to be widened as future Express Lane ramps shall meet the minimum requirements for standard WP-2 in addition to structural and lateral drainage design requirements. Lateral drainage of the general purpose lane pavement subbase layers shall be facilitated by any alternate pavement designs for the Express Lanes. All alternate Express Lane pavement designs shall be submitted to the Department for design concurrence prior to submission of the final price proposal.
- H. Approach slabs for all bridges shall be full width from face to face of barrier or parapet (including extending under sidewalks and shared use paths).
- I. Rumble strips are not required east of US 29 (Gainesville).
- J. Developer's plans, typical sections, profiles and cross-sections shall include the appropriate elements identified as a result of the drainage analysis/design and the pavement design. This shall include, but is not limited to, underdrains, stormwater inlets and pipes, and pavement sections reflecting the elements identified in the Developer's final pavement design.
- K. The area surrounding pavements shall be graded to direct surface water away from paved 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 Road and Bridge specifications and applicable special provisions.

- L. No utility cuts shall be allowed after the surface course asphalt lift has been applied.
- M. The Developer shall submit to the Department for its review, thirty (30) days before the submittal of associated final Design Documentation, a pavement design report that documents the assumptions, considerations, and decisions contributing to the Developer's proposed pavement design, including the following:
 - 1. Pavement design details by location, including structural layer materials, general specifications, and thicknesses;
 - 2. Relevant pavement evaluation data (structural and functional) and condition information on adjacent roads;
 - 3. Relevant geotechnical data and drainage requirements to verify the pavement design(s);
 - 4. Design criteria used in determining the pavement design(s), including annual average daily traffic, percentage heavy vehicles, cumulative traffic loading, pavement material strength factors, and pavement design life; and
 - 5. Design calculations documenting the pavement design(s) in accordance with the specified design methodology.

3.8 Traffic Engineering

3.8.1 General

- A. The Developer shall provide plans for all traffic control devices with its Design Documentation. Transition from new markings, markers, and delineators to existing shall be planned such that road users will discern only a minimum change in delineation concept. Design Documentation for the Department's review and approval for traffic control devices shall be submitted as a complete package for each construction segment. All new and existing traffic control devices within the Project limits and those signs outside the Project limits shall be installed, modified, or replaced in accordance with the standards and specifications set forth in Attachment 1.5.
- B. All traffic control devices shall be designed and installed to comply with the standards and specifications set forth in Attachment 1.5 and the requirements of the maintaining agency.
- C. The Developer shall be responsible for the design and construction of the Project signing, pavement markings, roadway and sign lighting, and traffic signals. Traffic control devices shall include:

1. All signs, signals, pavement markings, pavement markers, roadway lighting, interchange lighting and delineators necessary within the Project limits; and
 2. Signs outside the Project limits that are necessary to lead traffic to and transition traffic away from the Project.
- D. All existing traffic control devices impacted by the Project shall be modified, upgraded, or replaced by the Developer to meet current Department standards.

3.8.2 Pavement Markings

- A. The Developer shall provide and maintain pavement markings and reflective pavement markers meeting the standards and specifications set forth in Attachment 1.5, including but not limited to, markings required for the Express Lanes.
- B. On any pavement reconstruction undertaken by the Developer, the Developer shall tie in and match the existing permanent pavement marking systems.
- C. Temporary pavement markings and striping may be placed on the final surface course upon approval from the Department and thermoplastic permanent marking may be used for final markings only at locations where modified WP-2 is used, such as flyover bridge tie-ins and slip ramps.
- D. Snow-plowable raised pavement markers shall be used to supplement pavement markings on affected roadways where required or recommended by the Virginia Supplement to the MUTCD. All permanent snow-plowable raised pavement markers shall be installed in accordance with VDOT Standard PM-8 and/or PM-9. Damaged or removed existing snow-plowable raised pavement markers within the Project limits shall be replaced in accordance with VDOT Standard PM-8 and/or PM-9.
- E. The Developer shall install E-ZPass logo pavement markings for all proposed entrance ramps. The final location shall be shown in the signing and striping plan for approval by the Department.
- F. The Developer shall install route shield pavement markings on all ramps of the I-495 interchange to assist drivers with lane selections. The Developer shall maintain the route shield pavement markings located on the Express Lanes for the Term.

3.8.3 Static and Dynamic Message Signs

- A. The Developer shall design, fabricate, install, and maintain all new guide, supplemental, route marker, regulatory and warning signs during construction required for this Project to meet standards and specifications set forth in

Attachment 1.5. The Developer shall also modify or remove any signage outside of the limits of the Project that is no longer appropriate or pertinent as a result of this Project. Any static or dynamic signs that serve both the Express Lanes and general purpose lanes will be maintained in accordance with the Performance Requirements set forth in the Agreement and Attachment 4.5.

- B. The Developer shall prepare a Signage Plan consisting of the Project Roll Plan and the Trail Blazer Roll Plan, and present the plans for review and comment by the Department. The Project Roll Plan will be used for reviewing the dynamic messaging and static signs on the I-66 corridor and connecting roadways to include proposed sign locations and messages for all guide signs and Express Lanes signs applications. The Trail Blazer Roll Plan will be used for reviewing static signs (trail blazers) on highways, feeder roadways and other roadways notifying motorists of the access to the Express Lanes.
1. The roll plans shall show proposed locations for relocating existing signs, proposed locations for new structures.
 2. The roll plans shall also display signing, both existing (to remain) and proposed, for all Mainlines, ramps and interchanges, as well as for the arterial streets, frontage roads, and any other roadways that contain signing that is affected by the Project.
 3. The roll plans shall also include the locations of all proposed and existing Dynamic Message Signs. The roll plan features shall include but are not limited to, the existing and proposed roadway alignments, right-of-way, baseline of construction (including stationing), and existing topography at the tie-in points of the roadway limits of work. The proposed pavement markings may also be shown on the roll plan.
 4. 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.
 5. Submittal of the roll plans to the Department shall occur prior to final design.
- C. The Express Lanes signage scheme will:
1. Support the integration of the Express Lanes with the existing roadway network.
 2. Facilitate navigation of the roadway network, including access to, travel along and egress from the Express Lanes.

3. Comply with the requirements for signage in the Electronic Toll and Traffic Management (ETTM) System.
 4. Clearly identify points of egress from the Express Lanes to the general purpose lanes.
 5. Where toll zone pricing is used to develop a trip price, inform drivers when they are passing the last exit before the next toll zone, and what toll rates are associated with the next toll zone.
- D. All new sign structures and foundations (full span and cantilever) shall be designed to accommodate the following additional loads for future use:
1. Cantilever Structures: additional static sign load of 50 square feet
 2. Full-Span Structures: additional static sign load of 200 square feet

For design purposes, sign dimensions shall be proportionally increased to achieve the additional future use sign area requirements listed above (while maintaining vertical clearance requirements). The cumulative width of sign panels need not be larger than what can be accommodated by the span length of the proposed sign structure.

- E. The Developer shall be responsible for planning, coordinating, and obtaining Regulatory Approvals, if required, and removing and disposing of structures and obstructions. The Developer shall relocate 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 reinstalled in their permanent locations prior to Project Completion. The Developer shall coordinate the salvaging and delivery of certain working components of the existing Dynamic Message Signs (DMS) with the Department. All sign structures and non-salvageable signs removed during construction should be disposed of by the Developer.
- F. No overhead sign structures shall be bridge-mounted or parapet mounted. Sign structures built into the bridge to support signs to be viewed by traffic traveling over the bridge shall be permitted. No sign structure foundation or support shall encroach on the adjacent shared use path, sidewalk, or shoulder area.
- G. The Developer shall be responsible for coordination with the Department or the pertinent local agencies or jurisdictions in order to install directional signage such as wayfinding, street names, motorist services, etc., including, without limitation, obtaining all applicable Regulatory Approval.
- H. The Developer shall adjust, cover, or replace all signage within the construction limits whose messages conflict with construction work.

- I. The Developer shall provide the necessary guide, warning and regulatory signs for the Project.
- J. Clearview font for positive contrast legends on guide signs will not be allowed as an alternative lettering style for this project.
- K. The Developer shall maintain all existing signs, including Specific Travel Services (Logo) Signs during construction. For any existing signs that require relocation due to construction, the Developer shall present pertinent details, such as sign face, mounting details, locations, temporary skids, etc., for the Department's review and approval, prior to relocation.
- L. The Developer shall modify or remove existing signs and structures that are rendered by the Project inaccurate, ineffective, confusing or unnecessary. The Developer shall obtain the Department's approval prior to making any such changes.
- M. The Developer 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 Developer shall provide comprehensive structural analysis for the Department's review and written comment prior to the commencement of design. To assist with the structural analysis, the Department will provide (if available) existing structural information, shop drawings, and foundation calculations to the Developer for each existing sign structure identified by the Developer.
- N. The Department will review the structural analysis provided by the Developer for each sign structure to determine whether or not the existing structure or sign can be modified as proposed. If it is determined that modifications to the existing sign structure or signs are not structurally acceptable, the Developer shall provide new signs and structures, in accordance with Attachment 1.5, to replace the existing sign structures and signs.
- O. Signs shall incorporate highly reflective sheeting material to optimize lighting installation.
- P. The Developer shall place milepost and intermediate markers on I-66 at 0.2 mile intervals on both the right side of the general purpose lanes and the inside median of the Express Lanes.
- Q. The mile markers shall conform to MUTCD. Reference Location Signs, and intermediate markers shall conform to the Virginia Supplement to the MUTCD Intermediate Reference Location Signs.

- R. For signing along the Mainline, all guide signs, dynamic message signs and other 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 Developer shall obtain a design waiver or design exception from the Department to reduce the spacing.
- S. The Developer shall perform line of sight analysis for all sign structures to confirm drivers have sufficient time to read the sign messages and signs are not visually obstructed.
- T. The Developer 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.
- U. All conductor and communication cables shall be in conduit; no direct burial or aerial cable allowed. Power and communication cables shall be installed in separate junction box and conduit systems.
- V. The Developer 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. Where ground-mounted, IDSP signs shall be installed on 2½-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 Developer is responsible for costs associated with removal and replacement of IDSP signs.
- W. The limits of directional and Express Lanes signage for the Project for which the Developer is responsible extend to provide sufficient information to users of the Express Lanes for direction and access purposes to all entry and exit points in accordance with the standards and specifications set forth in Attachment 1.5.

3.8.4 Traffic Signals

- A. The Developer shall design, supply and install all necessary temporary and permanent traffic signals and related infrastructure for the Project as provided by this section and the standards and specifications set forth in Attachment 1.5.

- B. The Developer shall design the Project to include new traffic signal installations and modifications to existing traffic signal installations meeting the design requirements of the maintaining agency. The Department will provide reasonable assistance to the Developer in obtaining the relevant design requirements from any maintaining agency.
- C. The Developer shall provide communications between all temporary and permanent traffic signals for the Project and the maintaining agency's traffic signal system. The communications medium shall be compatible with the maintaining agency's communication system or plan.
- D. New traffic signals on the Project will be integrated with existing traffic signals using the following approach:
 - 1. The Developer shall design, construct, program, and adjust controller timings for the new signalized intersections for coordinated operations matching the maintaining agency's existing coordination plans. The Developer shall provide timing for existing or new signal coordination plans in the same format as the maintaining agency. Additionally, the Developer shall adjust signal timings for modified signals and develop signal timings for new signals. The signal timing parameters, including but not limited to vehicle and pedestrian clearance intervals, shall be calculated based on Department's standards.
 - 2. The Department will provide the traffic signal controller cabinets. The Developer shall obtain these cabinets from the Department facility, located in Northern Virginia. The Developer shall provide at least four weeks' notice to the Department prior to obtaining the cabinets. The Developer shall be responsible for any damage during the transportation and may be required to reimburse the Department should replacement cabinets be required.
 - 3. The Developer shall configure any traffic signal detection equipment to provide continuous traffic counts at the intersection according to maintaining agency requirements.
 - 4. The Department or the maintaining agency will test and commission any new signalized intersection for network operations with the existing traffic signal system and will retime network signals, as needed, to accommodate network demand.
 - 5. Where possible, the Department will optimize traffic signal timing at any signalized intersections with Express Lanes entry and exit ramps and approaching roadways to ensure that traffic does not normally produce queues that create a safety hazard on either the Express Lanes or the approaching roadways.

- E. All pedestrian displays shall be countdown signals. Pedestrian pushbuttons shall be a minimum of 0.5 cm (2 in) across in one dimension and all design shall be in accordance with Standards and Specifications listed in Attachment 1.5. Fully Accessible Pedestrian Signals (APS) shall be included approved by the Department.
- F. The Developer shall keep the existing signalized intersections within or adjacent to the project limit functional during construction. If signals must be shut down to facilitate construction, the Developer shall provide temporary signals or appropriate alternate traffic controls approved by the Department. Temporary signal shut down shall not be permitted.
- G. For each phase defined in the MOT Plan and temporary traffic control plans, the Developer shall develop signal timing plans for the Project and roadways designated as detours and submit the plans to the Department. The Developer shall implement, observe, and adjust signal timings to prevailing conditions during temporary MOT. The Developer shall develop signal timing plans for all peak and non-peak periods which may require more than eight (8) plans.
- H. The Developer shall install and be responsible for all aspects of temporary and permanent traffic signal installation to include but not be limited to design, obtaining permits, construction, modifications, rehabilitation of disturbed areas, and acquiring timely installation of power and communication connections.
- I. The Developer shall install and connect power service for temporary and permanent traffic signals for the Project.
- J. Conductor/communication cables shall be placed in buried conduit, embedded conduit, and structure and bridge-mounted conduit. Aerial or direct buried cable installation shall not be allowed.
- K. The Developer shall not cut any open trenches in pavement for the installation of conduit.

3.8.5 Roadway Lighting

- A. Lighting conditions shall conform to the Department's standard lighting requirements for freeway operations and shall be subject to the Department's approval.
- B. All new lights shall be Light Emitting Diodes (LED) in accordance with Attachment 1.5.
- C. All new light fixtures shall be equipped with individual photocells and nodes.

- D. The Developer shall install continuous freeway lighting for the entire roadway including interchanges and underbridge lighting. The Developer shall install lighting for any sidewalk or shared use path underpasses.
- E. The Developer shall design and construct the permanent roadway lighting system such that the Department can maintain and operate the lighting system for the general purpose lanes separate from the Express Lanes unless the Department and Developer mutually agree to a plan that governs cost, maintenance, and operational responsibilities.
- F. Temporary and permanent lighting facilities for the project shall be installed to ensure lighting facilities meet current Department Lighting Design Standards and Guidelines (found in Chapter 2 of the VDOT Traffic Engineering Design Manual) and ANSI/IESNA RP-8 requirements.

G. Requirements for Lighting Design

All lighting design shall:

1. Be prepared in accordance with the USDOT Roadway Lighting Handbook and the AASHTO Roadway and Lighting Design Guide;
2. Be performed using AGI-32 computer software; and
3. Include point-to-point lighting analysis and calculations submitted to the Department for review and approval.

H. Roadway and Interchange Lighting

1. For new Developer constructed I-66 bridge structures where the structures form an overpass or underpass on the Project, underpass lighting shall be installed as required by the VDOT Traffic Engineering Design Manual.
2. Lighting in the vicinity of toll zones is required.

I. Lighting Required as Mitigation

As first order of precedence, the Developer, at its sole cost and expense, shall provide any and all lighting required as mitigation for any design exceptions or design waivers included in Attachment 3.1b, or by the IJR.

3.8.6 Power

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

- B. Where new duct bank is installed, the Developer shall provide and install, for the Department, power conduit along or adjacent to the Project, consisting of:
 - 1. Two 2-inch Department conduits with tracer wire;
 - 2. Separate electrical junction boxes for the Department access;
 - 3. New power cable from existing Department assets served by the existing duct bank to the nearest power source; and
 - 4. Power within defunct existing duct bank shall be de-energized and safely abandoned per industry standards.
- C. The Developer is 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 Work.
- D. The Developer shall install and have connected power service for new or relocated traffic signals and lighting (sign, roadway, and interchange) for the Project per Department requirements. Traffic signal electrical service shall be separately metered from lighting and ITS assets.
- E. The Developer shall provide back-up electrical power service to support Operations and Maintenance Work in emergency situations where the primary power source is not available.
- F. The power supply for the ETTM Equipment shall be separately metered.
- G. Where approved by the Department, new Express Lanes lighting, ITS and TMS roadside equipment may be connected to existing Department electrical service panels.
- H. The Developer shall provide back-up power for the operations of the tolling systems which includes the pricing confirmation DMS, CCTV cameras, and other Express Lanes ITS, if part of the tolling system.

3.9 Barriers, Guardrails, and Fences

3.9.1 Barriers and Guardrails

The Developer 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 Developer shall design and install an approved guardrail or 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 must be upgraded by the Developer 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.

3.9.2 Fences and Barriers

- A. The Developer shall install right-of-way fencing to protect the Limited Access Highway where the sound barrier wall is not acting as a barrier unless otherwise approved by the Department.
- B. The Developer shall be responsible for securing the Work and providing all temporary fencing necessary to ensure the safety of the work force and members of the public.
- C. The Developer shall perform a safety risk analysis to determine whether fencing should be used to separate the sound barrier wall erection work zones from adjacent properties and, if such analysis shows that fencing is required, the Developer shall provide temporary six-foot-high (minimum) chain link security fencing at any such locations.
- D. Glare screens or extended height barriers shall be installed on all concrete median barriers separating the Express Lanes with glare conditions.
- E. Except for temporary fencing, all chain link fabric, posts, rails and other associated hardware for fences, including these items on permanent structures, shall be black vinyl-coated and the details for fences shall be in accordance with the standards in Attachment 1.5.

3.10 Aesthetics

3.10.1 General

- A. The Developer shall develop a Corridor Aesthetic Plan (CA Plan) in accordance with the standards and specifications set forth in Attachment 1.5. The Developer shall provide an opportunity for localities and key stakeholder input to the CA Plan. The CA Plan may have variations based on locality preferences, but shall have harmony throughout the corridor.
- B. The following items shall be considered (but not limited to) in defining the aesthetics concepts for the Project design when these features will be visible to the public upon completion:
 - 1. Material, finish, color, and texture of sound barrier walls, retaining walls (MSE walls, soil nail walls, tieback walls, gravity walls, etc.), bridge elements (barriers, railings, abutments, wingwalls, piers, etc.);

2. Paved slope treatments at interchanges and intersections;
 3. Fencing; and
 4. Any permanent building construction for the Project.
- C. Aesthetic elements shall be easy to maintain and resistant to vandalism and graffiti.
- D. Aesthetic elements shall be fully integrated with the overall landscape design.
- E. The use of natural materials shall be considered at select key features.

3.10.2 Specific Requirements

A. Sound Barrier Walls

Architectural treatment shall be considered for both the roadway and the landowner side of all sound barrier walls. Architectural treatment details on the roadway side shall be in accordance with the requirements of the Manual of Structure and Bridge Division Volume V Part 12 Sound Walls – Architectural Treatment. Architectural treatment on the landowner side shall be in accordance with the CA Plan.

B. Retaining Walls

Architectural treatment details shall be in accordance with the requirements of the Manual of Structure and Bridge Division Volume V Part 2 Chapter 5. Architectural treatment shall be applied to the roadway side of all retaining walls. Requirements for architectural treatment details on the landowner side shall be in accordance with the CA Plan.

C. Bridge Pier Geometry

Piers used for all bridges shall be limited to the following types: hammerhead piers with rectangular columns, multi-column piers with rectangular columns (1.5:1 minimum aspect ratio), wall piers, circular or rectangular columns for straddle piers.

3.10.3 The CA Plan shall show the aesthetic and architectural treatments for the Project corridor, included but not limited to the following features, through renderings and details:

- Aesthetic treatment of the new bridge, retaining wall, and sound barrier wall elements on the Project.
- Aesthetic treatment of existing bridge, retaining wall, and sound barrier wall elements on the Project.

3.10.4 The CA Plan may include separate sections showing proposed architectural treatments, through renderings and details, for interchanges that are being reconfigured such as I-495, Route 243 (Nutley Street), Route 123, Route 28, and at new access points to I-66 Express Lanes.

3.11 Landscaping

3.11.1 General

- A. The Developer shall provide landscaping as required to mitigate Project impacts to the community. In addition, landscape plans shall be provided if required by the Department of Historic Resources and in accordance with the environmental commitments. This includes watering, weeding, and maintaining the landscaping for a period of two growing seasons after the plants are accepted by the Department.
- B. Landscape plans shall be prepared by a Virginia Licensed Landscape Architect and shall be submitted to the Department for review and approval. The plans shall be prepared in a format consistent with the Department's standards for roadway plans.
- C. Existing forested areas that are impacted are to be reforested after construction with 1-inch caliper stock trees planted approximately ten feet on center and stabilized with low growing, native, and non-competitive grasses.
- D. All plant materials shall be indigenous to the area and be able to adapt and survive in roadside environments, as appropriate.
- E. The Developer shall assume that adequate locations will be identified within the proposed ROW.
- F. The Developer shall provide reforestation landscaping of approximately 6 acres of a selected location on Manassas National Battlefield Park with native species to create a natural screen of I-66 from the historic battlefield viewshed. A map of the location is included in Attachment 3.11. The Developer shall develop a landscape scope and plan during the final design phase acceptable to NPS and the Department. The installation of the plantings shall be conducted under permit or license from NPS to be acquired by the Developer. Access to the planting locations on the Park shall be via routes to be approved by NPS. Native species desired by the NPS include: white oak (*Quercus alba*), pignut hickory (*Carya glabra*), eastern Redbud (*Cercis Canadensis*), northern red oak (*Quercus rubra*), eastern red cedar (*Juniperus virginiana*), flowering dogwood (*Cornus florida*), and Virginia Pine (*Pinus virginiana*).
- G. The Developer shall provide reforestation landscaping of approximately 0.1 acre at the location of the current entrance to the athletic fields at Ellanor C. Lawrence Park off of Route 28 following closure of the entrance. The

Developer shall develop a landscape scope and plan during the final design phase acceptable to Ellanor C. Lawrence Park and the Department. The installation of the plantings shall be conducted under permit or license from Ellanor C. Lawrence Park to be acquired by the Developer.

3.12 Capital Asset Facilities

3.12.1 General

- A. If the Developer constructs a building within the ROW on state property, except for any of the ETTM facilities, the Developer shall submit plans and specifications to the Department of General Service's (DGS) Bureau of Capital Outlay Management (BCOM) to obtain a building permit. At completion, the Developer shall have the building inspected by BCOM to obtain an occupancy permit. Also any building project constructed on state property costing \$500,000 or more will require an Environmental Impact Review processed through the Virginia Department of Environmental Quality and approved by the Governor. The Department does not guarantee that the Developer's request will be desired or accepted. The Developer's plans must be approved by the Governor as required by Section 2.2-2402 of the Code of Virginia. Further, all construction work shall comply and be consistent with the Uniform Federal Accessibility Standards as applied to buildings on government property. Also, the Developer shall obtain any other permits and approvals required under Law.
 1. If the Developer wants to make changes, additions or improvements to the structure in the future, BCOM approval is required.
 2. Section 2.2-1149 of the Code governs the acquisition of property for office space, district offices, residencies, or area headquarters and provides that for such acquisitions, Governor approval is required and the normal DGS requirements for acquisition of capital outlay property would apply.
- B. The overall design and construction shall comply with Virginia Energy Conservation and Environmental Standards, DEB Notice 12018 and all applicable building and fire codes.
- C. The Developer shall obtain building permits and Regulatory Approvals for construction and occupancy.
- D. The Developer shall procure any zoning variances required for construction and occupancy.
- E. If the Developer buys property outside of the Project ROW with the intention of retaining ownership of it throughout the Term and then transferring it to the Department when the Agreement expires, then all of the requirements for construction listed above will apply. If the Developer buys vacant property that will ultimately be owned by the state at the end of the Term, the Developer will

be required to have building permits and occupancy permits for any new structures. If the Developer buys land with existing buildings and the property will ultimately be owned by the state, the Developer will have to obtain an occupancy permit approved by BCOM.

- F. If the Developer buys property outside the Project ROW, and the property will ultimately be owned by the state at the end of the Term, the Department will conduct an environmental site assessment and develop an agreement concerning the initial environmental condition of the property. The agreement shall allow the Department to periodically inspect the property for environmental or other issues and allow the Department to perform another site assessment before the property becomes state property to assure the property is environmentally acceptable. If the property is not acceptable, the Developer shall clean the property to standards acceptable to the state before the property will be approved or accepted by the Department.

3.13 Sidewalks and Shared Use Paths

3.13.1 General

- A. The Developer shall design and construct the Project to include proposed pedestrian, bicycle and equestrian facilities within the Project corridor, as identified in the RFP Conceptual Plans. The Developer shall not preclude the future design and construction of pedestrian, bicycle, and equestrian facilities currently being planned or anticipated.
- B. Existing pedestrian and bicycle access on facilities shall be maintained to the maximum extent possible throughout construction as per the MUTCD and the Virginia Work Area Protection Manual. Any temporary pedestrian or bicycle facility closure request shall be submitted in writing twenty-one (21) days in advance to the Department for review and approval. Advance notification of closures shall be provided to the public similar to scheduled roadway closures.
- C. New bicycle and pedestrian path facilities and modifications to existing bicycle and pedestrian path facilities shall be designed in accordance with the standards and specifications set forth in Attachment 1.5. All new bicycle and pedestrian path facilities intersecting I-66, the associated Interstate ramps, or other roadway facilities as depicted on the RFP Conceptual Plans shall be grade separated (over or under) unless otherwise approved by the Department.
- D. Where a box culvert is replaced along a proposed or existing trail, the new culvert barrel carrying the path shall have sufficient width and vertical clearance to accommodate the shared use path and a handrail adjacent to the stream. In lieu of this, a separate barrel may be solely dedicated for shared-path use. The walking surface of the path shall be located above the five-year stormwater level. Where the path also serves as an equestrian trail, the vertical clearances

shall be increased accordingly. Lighting shall be required for all bicycle and pedestrian path underpass structures and facilities. This lighting shall be installed in accordance with the VDOT Traffic Engineering Design Manual.

- E. The Developer shall conduct coordination meetings with all local jurisdictions and the Department to ensure existing and planned pedestrian, bicycle and equestrian facilities are identified along the Project corridor. Any planned facility that is not constructed with this project shall not be precluded in the future. For locations where new bridge overpasses are proposed to widen existing bridges with end spans that contain slope protection, the new bridge shall not be reduced in length and the new end span shall not preclude shared use path placement.
- F. The Developer shall coordinate with the Department and local jurisdictions on the design, maintenance of traffic and construction staging of the bicycle and pedestrian facilities within the Project limits.
- G. Concrete and asphalt pavement designs for sidewalks and shared use paths shall be in accordance with Attachment 3.7. If a locality wants a stone dust surface on a facility, the Developer shall coordinate obtaining a maintenance agreement for the Department with the Locality. The specifications for the stone dust surface shall be approved by the Department.
- H. The Developer shall design and provide drainage for any new independent pedestrian or shared use path bridge or underpass structure. Drainage scupper grates on bridges and drainage grates in underpass structures shall be located within the 2-foot shoulder of the path unless otherwise approved by the Department. All drainage grates shall be bicycle friendly and meet ADA requirements. All drainage grate installation orientation shall prevent bicycle or pedestrian encumbrance.
- I. The Developer shall design a shared use path parallel to I-66 that is consistent with the RFP Conceptual Plans. Where proposed noise barriers are to be located near homes, the path shall be on the I-66 side of the noise barrier. In addition, a roadway barrier with fencing shall separate I-66 vehicular traffic from the new pedestrian/bicycle facility.
- J. Where possible, utility manholes should be located outside of any pedestrian areas (sidewalks, paths, etc.). If necessary, utility access manholes may be located within the 2-foot shoulder of the 10-foot shared use path. Where manholes are located within a sidewalk or shared use path, the manhole covers must be ADA compliant.
- K. Access points to the shared use path parallel to I-66 shall be provided at approximately half mile increments. These locations may be co-located with other access needs to reduce the breaks in the sound barriers. The Developer shall coordinate with adjacent and nearby communities and local jurisdictions

regarding the locations and design of each access point. Possible access points are in the vicinity of the locations listed below:

1. Braddock Rd at NW Quadrant of Route 28 Interchange. Underpass for connection to future trail to Route 28 north.
2. Audrey Dr (Cabells Mill Development, Centreville).
3. Connect to the standard turn at the end of Veronica Rd (Cabells Mill Development, Centreville).
4. West side of Stringfellow Rd connection to Park & Ride Lot and street crossing to east side of street trail.
5. Fair Lakes Shopping Center (behind Target).
6. East Market Shopping Center (behind Whole Food Market).
7. Existing trail from Waples Mill Rd (NE Quadrant of US 50 Interchange).
8. Arrowhead Dr/Rosehaven St (SW quadrant of Route 123 Interchange).
9. Bushman Dr (just east of tennis courts property).
10. Cedar Lane north side connection to I-66 parallel trail.
11. Connection to west bend of Yeonas Drive (west of Southside Park).

The above access points are shown on the RFP Conceptual Plans and the Bicycle/Pedestrian Concept Feasibility Study exhibits.

- L. Mile marker and wayfinding signs shall be incorporated into the design.
- M. Existing trails impacted by the Project shall be replaced.
- N. The Developer shall provide 8 permanent non-motorized traffic counters composed of combined bicycle detector loops and passive infrared sensors. The location of counters shall be proposed by the Developer and approved by the Department. The infrared sensors shall be enclosed in a vertical post. The posts should have a 2-foot clearance from the path where possible. The proposed continuous count equipment and vendor shall be approved by the Department.

Each counter shall be able to:

1. Count both pedestrians and cyclists;
2. Differentiate between pedestrians and cyclists;

3. Measure the direction of travel of both pedestrians and cyclists;
4. Provide for automatic remote transmission of data via a modem;
5. Provide for in-field transmission of data wirelessly to a field computer;
6. Record count data at 15-minute intervals, 24 hours a day, 365 days a year;
7. Provide a detection height of 24 inches to 36 inches (for infrared sensor);
8. Operate in temperatures from -30 degrees Fahrenheit to 100 degrees Fahrenheit;
9. Be waterproof; and
10. Provide a wood post housing for natural settings or a metal vandal resistant post for urban settings.

Software used for transmittal and storage of data shall be able to:

1. Provide customizable alert system for missing or unusual data;
2. Provide the ability to combine data from multiple counters;
3. Provide the ability to record site description data;
4. Provide an estimate of counter battery levels;
5. Provide a data transmission subscription for each counter;
6. Provide the ability to create multiple viewer accounts; and
7. Provide the ability to view, edit, and create reports.

3.14 Structures

3.14.1 Types of Structures

For purposes of this Section 3.14, the term “structures” shall encompass the following:

- A. Bridges and Large Culverts (Culverts) as defined in IIM-S&B-27 *Bridge Safety Inspection*
- B. Traffic Structures of the type listed in IIM-S&B-82 *Traffic Structures, including Toll Gantries*
- C. Retaining Walls

D. Sound Barrier Walls

3.14.2 Bridges and Culverts

A. General Requirements

1. The bridges for this Project shall be designed using AASHTO *LRFD Bridge Design Specifications*; Interim Specifications; and VDOT Modifications (IIM-S&B-80 *VDOT Modifications to AASHTO LRFD Bridge Design Specifications*).
2. Infinite life fatigue requirements shall apply to all bridges.
3. Bridges shall be designed to meet all applicable hydraulic requirements, including current FEMA and the Department guidelines as described in the latest edition of the VDOT Drainage Manual. The Developer shall deliver to the Department a final Hydrologic and Hydraulic Analysis and final Scour Analysis for the proposed bridge designs as outlined in these Technical Requirements. These analyses shall be submitted to the Department for review and approval prior to the commencement of bridge construction.
4. Bridge width and length shall be determined by the functional classification of roadway(s) being considered and the facility being intersected, as well as the requirements of Attachment 3.14a Bridge Replacements. Under no circumstance shall the minimum vertical clearance be less than 16 feet 6 inches over existing and proposed roadways and streets carrying vehicular traffic, unless an applicable Design Exception or Design Waiver is listed in Attachment 3.1b. Minimum vertical clearance of 18 feet 6 inches shall be provided for roadways, bridges or other structures under straddle bents, integral straddle bents, and integral pier caps. For bridges over I-66, the aforementioned minimum clearances shall also be verified for the lane and shoulder layout shown for the Preferred Alternative. The minimum clearance over existing Metrorail tracks shall be 15 feet.
5. Each new bridge parapet or rail shall include a bridge conduit system. The conduit system shall comprise of two 2-inch diameter conduits. A junction box system shall be required for each of the conduits. No more than two (2) conduits shall be embedded in each parapet or railing. The maximum size of conduits embedded in parapets or railings shall be 2-inches in diameter. The location of the first conduit shall be as shown in the standard drawing for Bridge Conduit System. The second conduit shall be located such that crash test criteria for the parapet or railing is not voided, as determined by the Department.

6. The Developer shall use Concrete class A4 (Low Shrinkage), in accordance with Attachment 1.5, for all bridge decks, bridge parapets/railings, bridge sidewalks, and bridge medians.
7. Bridge longitudinal joints will not be permitted on new bridges or modified existing bridges, except when the joint is located within the median. When, as a result of elimination or relocation of a raised median, an existing longitudinal joint will be located outside the limits of a raised median, the longitudinal joint shall be eliminated. At a minimum, longitudinal joint elimination shall require the removal and replacement of deck concrete on either side of the joint to centerline of the adjacent girders. Furthermore, the performance of all bearings impacted by the longitudinal joint elimination shall be evaluated and all necessary modifications to bearings, including bearing replacements, shall be considered.
8. Post-tensioning of any type shall not be allowed (with or without grout or ducts). Exempt are prestressed concrete voided slabs with transverse ties or prestressed concrete box beams with transverse ties as specifically noted in the Manual of Structure and Bridge Division Vol. 5 Part 2 Chapter 12.
9. Furnishing and placing hydraulic cement concrete for concrete elements whose minimum dimensions exceed 5 feet shall be performed in accordance with the Special Provision for Hydraulic Cement Concrete for Massive Construction. Regardless of minimum concrete element dimensions, the maximum allowable thermal gradient between the core and skin temperature of a concrete pour is limited to 35° Fahrenheit and the maximum allowable temperature in any portion of the concrete pour shall be 170° Fahrenheit for slag and cement mixes and 160° Fahrenheit for fly ash and cement mixes. For concrete elements where the minimum dimension is 5 feet or less, and where the potential for exceeding the maximum allowable thermal gradient and maximum allowable temperature limits above may exist, it shall be the Developer's responsibility to determine if the Special Provision Hydraulic Cement Concrete for Massive Construction should be used for furnishing and placing the hydraulic cement concrete for such elements.

B. Details and Drawings

1. All details and drawings should be in accordance with Volume V Series of the Manual of the Structure and Bridge Division. Should any such details not be available, Developer shall implement a modified version of the requirement such that it is in compliance with AASHTO LRFD.
2. 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 Developer shall make the necessary modifications or shall submit an alternate detail that is acceptable to the Department.

3. A preliminary type, size, and location plan, including all proposed stages of construction, shall be submitted by the Developer to the Department for review and approval prior to proceeding with final design. The stage construction plans shall outline expected methods of protecting roadway users and pedestrian traffic during each stage. Additional requirements for Plan Submittals shall be in accordance with the Agreement as outlined in other sections.

3.1 The Department standard parapet and rail shall be used.

3.2 Pedestrian fence on bridges shall be one of the following:

- Guardian 5000 with DutyGuard 3-5-8 mesh as manufactured by BetaFence USA.
- Invisible Wall as manufactured by ClearVu.

All fence elements shall be powder coated in accordance with the manufacturer's specifications. Fence color shall be in accordance with the requirements of Section 3.10 and as approved by the Department.

Fence posts and rail sections shall be tested for continuity to ensure system grounding.

C. Superstructure

1. Bridge type and layout shall be based on reducing long-term maintenance costs for the Department. The use of continuous span units and jointless bridge design technologies shall be used as outlined in the VDOT Manual of the Structure and Bridge Division, Volume V – Part 2 Chapter 17.
2. Joints in bridges may be used only with specific written approval of the Department by the State Structure and Bridge Engineer through a design waiver.
3. No timber bridge elements of any kind will be acceptable in the proposed structure.
4. The Developer shall make reasonable efforts to design structures that do not require fracture critical bridge elements. Fracture critical bridge elements will only be permitted if demonstrated to be required and as approved by the Department.

5. Either prestressed concrete or structural steel beams and girders may be used.
6. For prestressed concrete alternatives, the precast concrete Bulb-T sections adopted by the Department shall be used. AASHTO shapes will not be permitted.
7. A sleeper pad will be required when the bridge abutment is either integral or semi-integral.
8. The use of asphalt overlays on concrete bridge decks shall not be permitted.
9. All connections of ramp bridges to intersecting overpass structures shall be made without the introduction of joint at the interface between the ramp bridge and the overpass. The connection at the intersection between the two structures, shall be designed either as a moment connection or, if a moment connection is impractical, a shear connection with a link slab (see Manual of the Structure and Bridge Division Volume V - Part 2 file 10.02-2 for a typical detail of a link slab).
10. When the introduction of a simple span is required to accommodate unique bridge layout requirements, options for eliminating the joints at the ends of a simple span shall be evaluated by the engineer of record. Such options may include, but not limited to, the construction of links slabs, or deck extensions.
11. The use of prestressed deck panels as stay-in-place forms shall not be permitted.
12. To the greatest extent feasible, curved beams/girders shall be parallel.

D. Substructure

1. The Developer shall ensure that all recommendations related to the suitability of foundation material for spread footings at the time of construction are confirmed in the field by the geotechnical engineer registered and licensed by the Commonwealth of Virginia. Foundation recommendations for the proposed bridge shall be submitted for review prior to the submittal of final foundation construction plans.
2. The use of steel piles in pile bents shall not be permitted. Pile bent supports shall not be used at any grade separation structure (overpass or underpass).
3. Areas around bearing seats shall be designed to permit jacking and replacement of bearings. The design forces for jacking shall not be less than 1.3 times the permanent load reaction at the bearing, adjacent to the point of jacking.

4. Pier columns for straddle bents, integral caps and integral straddle bents, if permitted, shall be protected by structurally independent, crashworthy ground mounted 54 inch high barriers in accordance with of the Manual of the Structure and Bridge Division Volume V- Part 2, Chapter 15.
5. Piers used for all bridges shall be limited to the following types: hammerhead piers with rectangular columns, multi column piers with square columns, wall piers, circular columns for straddle piers, and dual circular columns for integral caps as detailed in Attachment 3.10 Aesthetics.
6. Substructures shall be self-supporting under all service life conditions including superstructure replacement. Superstructure shall not participate in the stability or strength of the substructure.
7. The maximum abutment backwall width without an expansion joint shall be 80 feet.
8. Dimensions of piers adjacent to existing or future WMATA trackways shall meet the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering requirements for a pier of heavy construction crash protection.
9. For all new and replacement bridges over I-66, pier and abutment locations shall not be in conflict with the layout of shoulders, lanes, and the limits of median space reserved for future Metrorail (except as shown in Attachment 3.14g).

E. Vaden Drive Direct Access to Express Lanes

See Attachment 3.14b Supplemental Design Requirements for the Vaden Drive Direct Access to Express Lanes Ramp Structure.

F. Existing Bridges

1. General Requirements

- 1.1 The requirements below are in addition to those listed in Section 3.14.2 (A through D) above.
- 1.2 For a list of existing bridges located within Project limits, see Attachment 3.14c, Existing Bridge and Culvert Information.
- 1.3 For a list of existing bridges which may contain asbestos, see Attachment 3.14c, Existing Bridge Information.

- 1.4 The Developer is required to submit plans for the modification of an existing structure that are consistent with Attachment 1.5, Standards and Specifications. Plan sets are also required to show all changes, including but not limited to vertical and horizontal clearances, lane configurations on and beneath bridge, addition of bridge conduit systems and other modifications.
- 1.5 All modifications to existing bridges, including complete or partial removal of a bridge, shall be staged as necessary to maintain travel lanes for the duration of construction and in accordance with the provisions of Work Restrictions and Maintenance of Traffic. Additionally, the Developer shall provide continuous and safe access for pedestrians and bicycle traffic through or around the limits of construction. Temporary pedestrian and bicycle access must comply with Americans with Disabilities Act Guidelines for State and Local Government facilities.
- 1.6 It is the Developer's responsibility to obtain and verify any required as-built field details and dimensions needed for any purpose including, but not limited to, modifying or dismantling any existing bridge.
- 1.7 To obtain copies of Bridge Safety Inspection Reports, Developer must complete a CII/SSI Non-Disclosure Agreement as outlined in IIM-S&B-71 Critical Infrastructure Information (CII)/Sensitive Security Information (SSI).
- 1.8 Barrier protection of structures shall satisfy the requirements of AASHTO LRFD, including the requirements of article 3.6.5 and the requirements of the Manual of Structure and Bridge Division Volume V - Part 2, Chapter 15.
- 1.9 Existing bridge spans shall be widened with the same beam type and same material (e.g. steel or concrete).
- 1.10 The Developer shall provide information that notes the largest customarily documented event (i.e. the 2, 5, 10, 25, 50, 100, and 500-year floods) that will pass under the widened superstructures of the bridges on I-66 over Cub Run and Bull Run at their lowest elevations with at least one foot of freeboard. If a one-foot freeboard under the widened superstructures cannot be achieved for the 50-year storm event, then the lowest point of each widened superstructure shall not be less than the lowest point of that existing superstructure, in which case the widening can be achieved using beams with less depth than the existing ones.

2. Scope of Work for Bridges to Remain in Place

2.1 The scope of work for bridges to remain in place or widened shall include the following:

- Bridge specific requirements listed in Attachment 3.14d Bridge Widening and Repairs, associated repair quantities in Attachment 3.14e Bridge Repair Quantities, and the following:
 - a. Inspection and evaluation of bridge deck shall be limited to delineating delaminated concrete for removal prior to placement of new overlay systems.
 - b. Inspection and evaluation of substructure shall be limited to delineating delaminated and spalled concrete for removal prior to performing substructure repair. Delineated areas shall be expanded 6 inches beyond each side, and top and bottom.
- Additional repair work necessary to achieve a minimum condition rating of 7 for bridge decks, superstructures, and substructures. Additional supplementary inspections to determine the scope and level of additional work needed.

2.2 Repair of substructure spalls and delaminations shall include providing and installing embedded galvanic anodes in accordance with Attachment 1.5.

2.3 Substructure cracks shall be repaired in accordance with requirements for Crack Repair Type B (Epoxy injection) in Attachment 1.5.

2.4 If it is determined by the Developer the cost of an existing bridge widening and rehabilitation is greater than the cost of a new bridge, then the Developer shall have the option to replace entire portions of the bridge or the entire bridge.

3. Additional Requirements

3.1 Only bearings that are included in the Manual of the Structure and Bridge Division Vol. V Part 3 shall be used in the widened portion of the bridge structure regardless of the superstructure type selected. Installation of new bearings and all necessary work shall be included in the scope of work for any superstructure replacement, and no existing bearing components shall be re-used. The Developer shall ensure that the existing and new bearings are compatible with each other, and will not result in over stressing the existing or new bearings.

3.2 Existing structural approach slabs shall be widened to the full width of the bridge where the existing bridge is being widened or where the

travel lanes are being modified unless approved otherwise by the Department.

- 3.3 The location of any deck construction joint shall be over a girder and between shear connectors from the girder to the deck, unless approved by the Department.
 - 3.4 When pier or abutment seats are adjusted to improve vertical clearances, a minimum of 6 inches of existing concrete at the top of pier or abutment seats shall be removed and new concrete and galvanic anodes placed to limits required for adjusted seats.
 - 3.5 Modifications to existing bridge joints shall be in accordance with Attachment 3.14d Bridge Widening and Repairs and Attachment 3.14e Bridge Repair Quantities.
 - 3.6 Existing bridge elements shall be evaluated to determine effects of bridge widening, superstructure replacement, joint closures or other modifications for the bridge. Regardless of design method used on the existing bridge, AASHTO LRFD shall be used for the initial evaluation of existing elements. For existing bridges not designed using LRFD and where it is determined that resulting LRFD factored loads are in excess of LRFD factored resistance, the Load Factor Method or Allowable Stress Method in accordance with the AASHTO Standard Specifications for Highway Bridges, 16th Edition, may be used for the evaluation of the existing elements.
 - 3.7 Existing bridge foundations shall also be evaluated for scour whenever the bridge is widened, or an adjacent bridge is widened or a new adjacent bridge is constructed. If calculated total scour for the new conditions is greater than calculated total scour for the existing conditions, then existing bridge foundations shall also be designed for the new scour in accordance with the requirements of the Drainage Manual and AASHTO LRFD.
4. Dismantling and Removing Existing Structures or Removing Portions of Existing Structures

With any demolition and temporary support over or adjacent to live traffic, the Developer shall submit to the Department an approved plan for review and concurrence prior to the commencement of any demolition work. The demolition plan shall include, but is not limited to, details of protection of the underlying bridges, roadway, and users. The Developer shall determine the effect of equipment loads on the bridge structure, and develop and submit plans which show the procedures for using the loaded equipment without exceeding the structure's design capacity. The Developer's plans

shall be signed and sealed by a Professional Engineer licensed by the Commonwealth of Virginia.

5. Live Load Rating of Modified Bridges

5.1 All modifications to existing bridges shall be evaluated for their impacts on the live load rating of the bridge. In addition to the requirements set forth below, modifications to an existing bridge shall not result in the bridge requiring a posting for live load carrying capacity.

5.2 If the current HL93 Rating Factor (as computed per the Manual for Bridge Evaluation) is greater than or equal to 1.0 at the inventory level, then the HL93 inventory rating factor for the modified structure shall be greater than or equal to 1.0.

5.3 If the current HL93 Rating Factor (as computed per the Manual for Bridge Evaluation) is less than 1.0 at the inventory level, then the HL93 inventory rating factor for the modified structure shall be greater than or equal to the inventory rating factor for the unmodified subject structure.

G. Bridge Drainage

1. The minimum dimension of pipe used in a drainage system for new bridges and widened portions of existing bridges shall be 8 inches.
2. To the extent possible, pipes and downspouts shall be designed to avoid interference with aesthetics of the bridge.
3. The use of ditches and open channels with grades greater than 10% shall not be permitted on slopes directly underneath a bridge or on slopes located within 100 ft. of a bridge structure. An enclosed drainage system shall be used to capture the bridge deck runoff including runoff from its approach slab, and convey the runoff to the bottom of the slope or into a drainage system.

H. Culverts

1. General Requirements

Culverts and modifications to existing culverts 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*); and shall comply with the VDOT Road and Bridge Standards, Vol. I & II. Should any standard for culverts not be in accordance with AASHTO LRFD, then the Developer shall verify

design and implement a modified version of the requirement such that it is in compliance with AASHTO LRFD.

2. Existing Culverts

2.1 If the Developer modifies (including extensions and increased loading) structural elements of any existing culvert, then the Developer is required to provide a design and plan set for the extension or modifications. The design calculations shall include assessments of any imposed settlement or differential settlement due to the new load conditions.

2.2 All modifications to existing culverts shall be evaluated for their impacts on the live load rating of the culvert. In addition to the requirements set forth below, modifications to an existing culvert shall not result in the culvert requiring a posting for live load carrying capacity.

- If the current HS-20 rating load is greater than or equal to 36 tons at the inventory level, then the HS-20 inventory rating load for the modified structure shall be greater than or equal to 36 tons.
- If the current HS-20 rating load is less than 36 tons at the inventory level, then the HS-20 inventory rating load for the modified structure shall be greater than or equal to the inventory rating load for the unmodified subject structure.

I. Load Ratings for Bridges and Culverts

1. Structure load ratings are required and shall be performed in accordance with the requirements of IIM-S&B-86 – *Load Rating and Posting of Structures (Bridges and Culverts)* and the following:

1.1 When a phased portion of a newly constructed structure is intended to carry traffic in a temporary configuration.

1.2 Load rating of any partial configuration of the existing structure.

1.3 A final, as-built, load rating analysis of each new structure reflecting traffic in its final configuration. This load rating should incorporate any as-built changes that may have been made, which in the judgment of the Developer will affect the load rating (e.g., minor changes to stiffener or diaphragm locations may not affect a load rating).

2. No partial or completed structure shall be placed into service if a Load Restriction (Posting) is required based upon the load rating analyses. The

Developer is responsible for all remedial measures and corrective action required to provide the Department a structure which satisfies the load rating requirement outlined in IIM-S&B-86– *Load Rating and Posting of Structures (Bridges and Culverts)*.

J. Safety and Acceptance Inspection for Bridges and Culverts

1. Acceptance of the bridge structure will require the following two independent inspections by the Department:
 - 1.1 A satisfactory safety and inventory inspection by the Department as described below is required prior to opening the structure or portion of the structure to public traffic. This safety and inventory inspection by the Department will serve as the initial inspection of the structure. Data gathered will include location, date completed, alignment, description, horizontal and vertical clearances, structure element description and condition data, and traffic safety features. Such inspections will be required prior to opening any newly constructed portion or phase of the bridge to traffic.
 - 1.2 A satisfactory final construction inspection by the Department is required prior to acceptance of the structure. To facilitate inspection of the structure by the Department, the Developer shall ensure that all structural elements are accessible and shall provide adequate resources including:
 - Man-lifts, bucket trucks, under bridge inspection vehicles, or other equipment necessary to inspect the structure as well as properly trained staff of sufficient composition to support the inspections.
 - Plans, procedures, personnel, and equipment to implement traffic control measures.
2. The Developer shall provide a minimum of thirty (30) days' notice to the Department whenever it requires the Department to undertake an inspection. The Developer's notice to the Department shall include the latest version of the plans (including all field design changes), traffic control procedures, a description of the items to be inspected and an anticipated schedule for the inspections.
3. Unless otherwise approved by the Department, structures shall be substantially complete (i.e., roadway, slopes on the approaches, and slopes underneath the structure are already in place) before the final construction inspection will be performed.

K. Plan Submission

1. The Developer shall make Stage I (Preliminary Plan) submissions and Stage II (Final Plan) Submissions.

1.1 Stage I (Preliminary Plan) Submission

- The Developer shall submit a Stage I (Preliminary Plan) submission for each new bridge, bridge replacement, and bridge widening and modification.
- Stage I submission must be submitted to the Department prior to any final design submittal, and at other appropriate times pursuant to the Department's concurrent engineering process. Final design prior to Department approval of the Stage I submission shall be solely at the risk of the Developer.
- The approval of the Stage I submission shall be subject to the approval of the detailed Hydrologic and Hydraulic Analysis study and Scour Analysis (if a waterway crossing), a preliminary geotechnical report completed in accordance with the requirements of Section 3.3 Geotechnical, and roadway geometry.
- Stage I submission shall include Stage I drawings prepared in accordance with the Stage I Plan Review Checklist, Stage I Report, Stage I Report Summary Form, and other preliminary plan requirements indicated in the standards and specifications as set forth in Attachment 1.5.
- The Stage I report shall follow the Stage I – Report Template set forth in Attachment 1.5 except as modified below.
 - Section 3.10, Constructability Issues: The Report need not consider constructability issues (except for how it relates to maintenance of traffic; the report shall include a section on maintenance of traffic).
 - Section 6, Bridge Preliminary Recommendation, is modified as follows:

The report need only describe the single alternative selected by the Developer to be constructed:

- a) In Section 6, the report requirements are extended to specifically address in detail all non-standard items, unique or complex features

- Section 7, Engineer's Cost Estimate for each Alternative, is not required.
- Section 8, Schedule, is not required.
- The report will include copies of design exceptions and waivers that influence the design of the structure or roadway approaches both over and under and shall include a write up on how the design exceptions and design waivers affect the bridge.

1.2 Stage II (Final Plan) Submission

- The Developer shall submit structure Stage II (Final Plan) submission for each new bridge, modification to an existing bridge, bridge rehabilitation, modification to lane and shoulder configuration on or under an existing bridge and culvert, or modifications to culvert structures.
- Final plans may be submitted as completed plan set(s) or in plan submission packages as approved by the Department (i.e., foundation plan package, substructure plan package, superstructure plan package, etc.). The final plans are to be submitted according to the submission schedule provided by the Developer.
- The Stage II drawings shall be prepared in accordance with the Stage II Plan Review Checklist.
- Final design calculations and construction drawings shall be signed and sealed in accordance with the VDOT Manual of the Structure and Bridge Division, Volume V - Part 2, Chapter 1, Section 16: Sealing and Signing of Plans and Documents.

2. Additional Requirements for Bridges

2.1 It shall be the responsibility of the Developer to request the following data from the Department's project manager:

- B-number, federal identification and plan number for each new bridge in the Agreement

2.2 Plan sets should contain sheets which are arranged and detailed as outlined in the Manual of Structure and Bridge Division – Volume V - Part 2.

3.14.3 Retaining Walls

A. General Requirements

1. 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 Road and Bridge Standards, Vol. I & II and as specified in the Technical Requirements.
2. Should any standard for retaining walls not be in accordance with AASHTO LRFD, then the Developer shall verify design and implement a modified version of the requirement such that it is in compliance with AASHTO LRFD.
 - 2.1 Retaining walls at bridge abutments shall be designed for a minimum service life of 100 years.
 - 2.2 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.
 - 2.3 MSE walls that require traffic protection at the top shall use barriers or railings on moment slabs.
3. Parapets/railings located on top of MSE walls shall use low permeability concrete in accordance with current VDOT Specifications.
4. Concrete paved ditches shall be used behind retaining walls except where the top of the wall is located adjacent to a roadway shoulder in which case an approved concrete barrier system shall be used. Paved ditches shall extend to the back face of the retaining wall. For soldier pile retaining walls, where a post extends behind a retaining wall panel, the ditch shall be located adjacent to the post. The area between the edge of the ditch and the back of the retaining wall panel shall be paved with 4 inches thick concrete, graded to drain away from the wall.
5. For maintenance of the area at the top of a wall or working surface, a VDOT standard HR-1, or equivalent fencing system as approved by the Department, shall be required when the following condition exists:

- Routine maintenance or inspection will be performed from the working surface or platform for which there is a 4-foot or greater distance above the next lower surface (OSHA 1910.23(c)1).

HR-1 railing shall be powder coated in accordance with Attachment 1.5.

6. The requirement in IIM-S&B-81.6 Corrosion Resistant Reinforcing Steels (CRR) for the use of Class I CRR Steel in portions of retaining walls (MSE wall panels or any other retaining walls including facing of anchored type walls and architectural treatment panels) located within 22 feet from the traveled way (splash zone) shall not apply to this Project.
7. The following requirements in the Manual of the Structure and Bridge Division Part 2 File No. 17.01-7 Abutments, General Information and Selection Criteria, Use of MSE Walls and GRS Technology shall not apply to this Project:
 - *“MSE wall location for overpass structures shall accommodate a minimum of one future lane in each direction for the roadway below the overpass.”*
 - *“MSE wall limits shall extend sufficiently to allow future widening of the overpass by one lane in each direction.”*

B. Modifications to Existing Retaining Walls

1. Retaining wall modifications shall be carried out in accordance with General Requirements for Retaining Walls.
2. If any Significant Work is completed on an existing retaining wall, the Developer shall ensure that all safety elements of existing retaining walls are brought up to current standards (example: railing). Significant Work includes, but is not limited to, the following:
 - 2.1 Raising the existing retaining wall; and
 - 2.2 Adding a sound barrier wall or other feature to an existing retaining wall.

C. Plan Submission

1. The Developer shall submit a preliminary plan for each new or modified retaining wall. Final design efforts prior to the Department’s preliminary plan approval shall be at the risk of the Developer.

Preliminary plans shall be submitted prior to any final design submittal. The Developer shall not submit any final plans until the preliminary wall submittal has been approved by the Department.

2. A retaining wall preliminary plan submittal shall include:
 - 2.1 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 barrier walls, sign structures, landscaping, irrigation systems, barriers, existing and proposed drainage structures, adjacent bridges, etc.
 - 2.2 A preliminary geotechnical report completed in accordance with the requirements of Section 3.3 Geotechnical.
 - 2.3 Where applicable, approval of the preliminary wall submittal shall be subject to the approval of an H&HA study and scour analysis.
3. Where retaining walls are located at bridge abutments, retaining wall plans, including preliminary plans shall be included in a bridge plan submittal.

3.14.4 Sound Barriers

- A. 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.
- B. Sound barrier wall posts shall not be spliced to soldier piles of retaining wall posts unless connection details are approved by the Department.
- C. The requirements of the VDOT Road and Bridge Specification, Section 519.03(c)2. Structure-Mounted Barriers shall also apply to moment slab mounted sound barrier walls.

3.14.5 Traffic Structures

- A. General
 1. Lane Use Management Signs (LUMS) shall be treated in the same manner as overhead sign structures that support variable message signs except that LUMS may be erected on cantilever structures.
 2. Small (i.e. 48" x 48' max. size) regulatory type sign panels on bridge structures may be installed using brackets attached to bridge parapets and deck slabs. The edge of sign panels shall clear parapet or rail by a minimum of 12 inches.

3. Overhead sign structures (span type only, no cantilevers) shall be supported on bridge deck blisters. The main bridge beam and girders shall be investigated for fatigue loading from wind loads of the sign structure. The minimum vertical clearance between the bridge deck and sign shall be in accordance with the VDOT Road and Bridge Standards.

B. Toll Gantries

1. The design of structures, toll gantries, and supports used for the violation enforcement, TMS, and tolling system roadside equipment shall be standardized.
2. The design for toll gantries will accommodate the following:
 - 2.1 Dead loads, wind loads and ice loads for toll and enforcement equipment, including equipment cabling.
 - 2.2 The vertical deflection of the toll gantry will not exceed the equipment manufacturer's desirable design specifications.
 - 2.3 Performance requirements for toll and enforcement equipment, to include but not be limited to, vertical clearance, twist about transverse axis, transverse rotation from level, member deflection, member natural frequency and resonance, foundation lateral deflection, maximum roadway cross slope at toll collection line and equipment clearance from other major infrastructure items.
3. The toll gantry columns and beams shall be fabricated of galvanized steel.

C. Existing Traffic Structures

1. The Developer 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 Attachment 1.5 for this Project. For structures that do not support variable message signs, the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 1994 may also be an acceptable alternative for verifying the design. Any existing structure that the Developer proposes to reuse must also be certified for the identified loads, including a statement sealed by a Professional Engineer licensed by the Commonwealth of Virginia that the reused structure is fully compliant with the Technical Information and Requirements and Special Provisions listed in Attachment 1.5 for this Project, 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 Northern Virginia District Structure and Bridge Section. The Department Northern Virginia District Structure and Bridge Section shall be notified prior to the removal or relocation of any existing traffic structure. Removed existing lighting poles shall not be relocated (new lighting poles shall be required).

2. Removal and Disposal of Existing Bridge-Mounted Sign Structures

All bridge-mounted sign structures located within Project limits shall be removed and if necessary replaced with new signs mounted on independent sign structures. Bridge mounted signs shall be completely removed, including frames, sign panels, hardware, and incidentals. Removed materials shall become the property of the Developer and shall be properly disposed of off-site. Connection bolts anchored into concrete parapets shall be mechanically cut flush with the surface of the parapet, and then removed by mechanical drilling to a depth of one-half inch below the surface of the parapet. The holes shall be patched to match the color and texture of the existing parapet surface with hydraulic cement mortar or grout conforming to Section 218 of the Road and Bridge Specifications. Connection bolts to steel beams shall be removed, and the affected areas of steel beams cleaned, primed, and painted in accordance with the requirements of Section 411 of the Road and Bridge Specifications to match the existing structure. Electrical service shall be disengaged at the nearest junction box, and all conductors shall be capped and sealed in place unless existing service is to be reused for lighting of replacement structures.

D. Inspection of Traffic Structures

1. 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 by the Developer before the structure can be accepted by the Department.
2. The initial inspection shall be performed by the Department. The Developer shall provide the Department with Approved for Construction drawings and working drawings, including all revisions at least two weeks prior to scheduling the inspections.
3. During the initial inspection, data including but not limited to location, date completed, description, horizontal and vertical clearances, structure

element description and condition, and traffic safety features will be gathered by the Developer and verified by the Department.

4. The Developer shall ensure that all structural elements are accessible for inspection of all structures. This requirement may dictate that the Developer 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.
5. Upon completion of the initial inspection, the Department will submit an inspection report to the Developer within 10 days of the inspection either recommending acceptance of the structure or identifying deficiencies, including incomplete work, which must be rectified by the Developer before the structure can be accepted by the Department. If a structure is not accepted, the Developer 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 Developer that the structure is acceptable without a further inspection.
6. The final acceptance of sign and 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.

3.14.6 WMATA Pedestrian Bridges

WMATA pedestrian bridges shall be in accordance with the requirements of Section 3.21 Transit Facility Design and the following:

- A. The Developer shall also protect abutments and piers of both new and existing WMATA pedestrian bridges in accordance with the requirements of Article 3.6.5 of the AASHTO LRFD Bridge Design Specifications.
- B. In addition to WMATA vertical and horizontal clearance requirements, all clearances under WMATA pedestrian bridges shall meet minimum project requirements for vertical and horizontal clearances, including the requirements of the Manual of the Structure and Bridge Division for minimum vertical clearance of pedestrian bridge over a roadway.

3.14.7 Miscellaneous Requirements

- A. The parapet and barrier walls on structures may be constructed using slip forming after the Department review and approval of the trial section.
- B. All temporary shoring and erection elements shall be dismantled and removed in their entirety following construction, unless otherwise approved by the Department.
- C. The following utilities shall be designed, furnished, and installed by the Developer:
 - 1. Lighting on the bridge
 - 2. Under bridge lighting (if required)
 - 3. Standpipe Fire Hydrant and Water Supply fire protection system shall comply with the requirements of NFPA 502 Section 6.6. Prior to fire protection acceptance, the Developer shall test the hose and standpipe systems for compliance with NFPA 25 and provide the Department with a letter from the Fire-Marshall confirming such successful test results as a condition of Project Completion.
- D. The Developer shall submit estimated quantities along with the associated unit costs for all standard and non-standard items in the final bridge plan submittal. The structure unit cost data is required to complete the VDOT Annual Bridge Construction Unit Cost Report which is provided to FHWA. This data shall be submitted to the Department within ninety (90) days of the Department's approval of the construction plan submittal.
- E. In addition to the guidelines outlined for the use of fencing in The Manual of Structure and Bridge Division Volume V Part 2 Chapter 30, pedestrian fencing shall be used on all overpass and ramp structures over freeways (interstate) or railroad regardless of whether the overpass structure provides pedestrian access (sidewalk, bikeway, etc.). The following structures may be excluded from this requirement:
 - 1. Overpass structures carrying Mainline Express or general purpose lanes traffic.
 - 2. Ramp structures carrying traffic between I-66 and I-495, except if the bridge is over the WMATA facility.
 - 3. Third level ramp structures such as at the Route 28 interchange.
 - 4. Other locations when determined by the Department that installation of fencing may interfere with access to perform bridge safety inspections.

- F. Piers and walls located adjacent to existing or future trackways shall be of heavy construction as defined in the AREMA Manual for Railway Engineering. They shall also be designed for all applicable loads specified in the WMATA Manual of Design Criteria. For new piers adjacent to future trackways, the piers shall also be designed for additional earth pressure loads assuming a grade difference of five (5) feet between grade at top of rails and lower grade of adjacent roadway.
- G. For placement of bridge substructure elements or walls within the space reserved for future Metro, see attachment 3.14g, Criteria for Placement of Bridge Piers and Walls within Limits of Space Reserved for Future Metro.
- H. Where any part of a drilled shaft, footing, or any other stiff element is to be permanently located directly beneath any permanent pavement, there shall be a minimum clearance of five (5) feet from the top of finished grade to the top of drilled shaft, footing, or stiff element.
- I. Sealer used in joints at sleeper pads shall be in accordance with the requirements of Section 420 of the Road and Bridge Specifications for Class II Joint Systems.
- J. Drilled shaft for support of bridges and retaining structures shall be constructed in accordance with the requirements of VDOT Special Provision for Drilled Shafts Using Self-Consolidating Concrete for Design-Build and PPTA Contracts – April 15, 2013.
- K. Should the Department develop guidelines for the use of unmanned autonomous vehicles (UAVs) in conducting bridge and ancillary structure safety inspections, the Developer shall comply, to the greatest extent possible, with such guidelines.

3.15 Electronic Toll and Traffic Management System

3.15.1 General

The Developer shall be responsible for the planning, design, and installation of an ETTM system comprising separate Electronic Toll Collection (ETC) and Traffic Management Systems (TMS) in accordance with the Agreement.

- A. The Developer shall be responsible for developing a concept of operations, using the I-66 Operations Concept Technical Report as a guide. The concept of operations shall be in the ANSI G-043 format in accordance with FHWA Systems Engineering Guidebook. The Developer's concept of operations shall include stakeholder involvement with the Department, Transit, Public Safety and Counties, Cities, and Towns, and other stakeholders within the Project limits. The Developer shall perform necessary Work for the Project's ITS Architecture and System Engineering in compliance with FHWA Rule 940.

- B. The existing fiber backbone and power distribution duct bank is located on the eastbound shoulder of I-66. The fiber backbone is a shared resource for servicing the Department, WMATA, and other agencies. The Developer shall not impact existing communication and power system currently used by Northern Region and partner agencies. Furthermore, the Developer shall maintain the existing fiber backbone and power distribution duct bank until newly installed system is fully operational. At all times the fiber backbone and power distribution duct bank for Northern Region and partner agencies shall remain operational, unless approved by the Department.
- C. The Developer shall maintain the existing communication network and keep it operational at all times for the duration of construction, unless otherwise approved by the Department. Additions, modifications and adjustments to the communication network and interfaces shall seamlessly reside and be fully interoperable with legacy networks and the Department ATMS software during and after construction.
- D. The Developer shall be responsible for providing design, installation, and maintenance, final acceptance, integration, testing, training, documentations, and final submission of as-built plans for the infrastructure (device and network components) being installed for the Department and partner agencies to use for software integration.
- E. The final placement of all ITS devices on the roadside (i.e. not on overhead structures) shall be such that routine maintenance activities can be performed on the device without requiring the closure of a general purpose lane or over the WMATA facility.
- F. The Developer shall record all new ITS devices in the Asset Identification Table. The information in the Asset Identification Table will be used to populate the NRO inventory database for central software, integration, device monitoring, and asset management.
- G. The design of all toll collection facilities shall incorporate the principles of Crime Prevention Through Environmental Design (“CPTED”). The Developer shall confirm that a member of the Project design team has completed training regarding CPTED principles. The Developer shall arrange for a review and approval of its toll facilities by the Virginia State Police Crime Prevention Unit.
- H. For Department Assets only, the Developer shall provide the Department with a sample unit of all ITS devices requiring integration with the Department’s ATMS software. This includes but is not limited to CCTV, DMS, Vehicle Detection Systems (VDS), and Video Monitoring System. The Developer shall furnish such equipment to the Department within one-hundred-twenty (120) days of roadway AFC plans being approved for construction so that the

Department can begin integration and testing with the Department's ATMS software.

- I. For all Department ITS items installed for the Project the Developer shall coordinate with the Department prior to Service Commencement on an exact list of required spare part quantities that shall be provided to the Department. The anticipated quantity of spares provided is not expected to exceed one spare item for each device of like type and nature.

3.15.2 Connected Vehicles Equipment

- A. The Department has Roadside Units (RSUs) for Connected Vehicles (CV) research installed on I-66 between I-495 and Gainesville which shall remain operational during and after construction.
- B. The Developer shall maintain power and communication to existing RSUs during construction and operations. During construction, downtime shall be limited to one instance for each RSU lasting no longer than 48 hours unless approved by the Department.
- C. The Developer shall install any relocated RSU at a comparable location as approved by the Department.
- D. Communications to RSUs shall be maintained as it currently exists via a dedicated network with dedicated fiber and Ethernet switches and routers. The RSU network shares cabinets, conduits, power and fiber infrastructure with the VDOT TMS. The Developer shall design and construct the completed project such that expansion of CV RSU coverage in the future can be accomplished by installing additional network switches to dedicated fiber and plugging to existing power at any cabinet within the Project limit.
- E. The Developer shall install Dedicated Short Range Communication (DSRC) technology on the Project to facilitate the implementation of Connected Vehicle technology. The DSRC technology shall allow vehicles to "connect" with each other (V2V) and with infrastructure (V2I) via two-way, high-data wireless communications. The Developer shall ensure the implemented technology is compatible with all existing Department CV infrastructure, and shall ensure connectivity with future technology. The Developer shall use the DSRC technology to facilitate execution of the pilot programs noted in subsection F.
- F. Pilot Programs
 1. Automated HOV Enforcement – The Developer shall endeavor to use automated cameras to identify the number of occupants in a vehicle, capture the vehicle's license plate, and generate an alert if the transponder setting is incorrect.

2. Virtual Road Signs – The Developer shall endeavor to have road signs presented to drivers virtually via in-vehicle displays.
3. Mayday Alerts – The Developer shall endeavor to provide roadside equipment that can sync with connected vehicles so vehicles can request assistance through nearby roadside equipment or other connected vehicles.
4. Lane Mapping – The Developer shall endeavor to equip connected vehicles with a lane model event management subsystem that can identify potential road obstructions based on a change in the expected lane configuration and transmit an alert to the driver and operations team.
5. Wrong Way Driver Detection – The Developer shall endeavor to equip connected vehicles with the ability to detect wrong way drivers, using information reported to the vehicle from connected roadside equipment.
6. Connected Maintenance Vehicles – The Developer shall endeavor to equip connected vehicles with the ability to identify regions of pavement that require immediate maintenance.
7. Unmanned Aerial Vehicle (UAV) Incident Response – The Developer shall endeavor to use UAVs to quickly transmit incident information from multiple vantage points to incident responders.

3.15.3 Business and Toll Operating Model

- A. The business and toll operating model implemented by the Developer shall comply with the requirements of the Agreement.
- B. The Project must provide the capability to read Transponders that are interoperable with the E-ZPass network (or any successor to E-ZPass used on other State Highways) and issued by either the Department or by another member of the E-ZPass Interagency Group or other entity with which the Department has established reciprocity for the purpose of charging via transponder reads.
- C. Transponder readers installed for the Project must be interoperable with the E-ZPass network (or any successor to E-ZPass used on other State Highways) and issued by either the Department or by another member of the E-ZPass Group or other entity with which the Department has established reciprocity for the purpose of charging via transponder reads.
- D. Equipment shall be installed with roadway and pricing information to be communicated to travelers with sufficient notice to allow decision on whether to use that roadway section.

- E. Transponder reader equipment shall be able to read the mode (HOV vs. Toll) of E-ZPass Flex transponders or other similar approved devices used to indicate the occupancy of the vehicle.
- F. Reader equipment shall be able to provide E-ZPass transponders with customer feedback messages in accordance with E-ZPass specifications or other specifications agreed with the Department.
- G. Enforcement equipment shall be installed on the roadside to capture vehicle information that can be used for toll enforcement and payment collection for vehicles that do not have prior arrangements to use the Express Lanes, including but not limited to a valid transponder. Violation enforcement shall follow practices in compliance with legislation and shall be subject to approval by the Department. Enforcement by the Developer shall include, but not be limited to, video enforcement, image review, customer service, and payment collection services. If an unpaid toll is paid within 90 days of notification, the administration fee shall not exceed \$25. Processes, policies and business rules shall be subject to review and approval by the Department at least sixty (60) days prior to implementation or change unless written agreement is provided by the Department to waive this period of review. All unpaid tolls shall be validated against customer account information and posted to such accounts according to business rules and processes defined by the Department. The Department may offer central clearing services to support the collection of unpaid toll which the Developer may use through separate agreement.
- H. An enforcement area shall be provided at or near each tolling point in a safe location as mutually agreed by the Department and the Developer for law enforcement vehicles.
- I. Vehicles shall be classified on the roadside in order to differentiate motorcycles and vehicle types, create exemptions and apply restrictions for use of the Express Lanes.
- J. All ETTM equipment and systems shall be monitored for health and alert failures automatically to maintenance staff to meet agreed response and repair times.
- K. The Developer's back office shall process transactions for automated clearing with E-ZPass accounts held by the Department and reciprocity agencies.
- L. Transactions shall be built into trips and rated according to the dynamically calculated toll rates for the time of travel.
- M. Rates shall be calculated dynamically based on real-time roadway conditions for volume, occupancy and speed.

- N. Customers shall be able to access a website and customer service representatives by phone for toll, roadway inquiries, account information and violation payments.
- O. Where customer accounts cannot be found, the system shall create violation notices to be sent to registered vehicle owners to collect payment for the toll plus a fine.

3.15.4 Systems Integration and Protocols

- A. The Developer shall implement and document a system engineering approach, consistent with FHWA 23CFR Part 940 Intelligent Transportation System Architecture and Standards (Federal Rule 940), in the development of systems and their associated interfaces. The Developer shall complete a Project architecture using the latest version of Turbo Architecture and coordinate with NRO to incorporate into the regional architecture. The Developer shall complete the Rule 940 Checklist. The system engineering approach shall address the following items where applicable:
 - 1. Project architecture
 - 2. Regional architecture update
 - 3. System architecture
 - 4. System specification
 - 5. Interface identification
 - 6. Interface specification
 - 7. Interface control
 - 8. System verification
 - 9. System testing
 - 10. System integration
 - 11. Configuration management
- B. The Express Lanes TMS shall be required to interface with the Department's ATMS at the McConnell Public Safety and Transportation Operations Center (MPSTOC) consistent with the Department ATMS Center-to-Center Interface, in collaboration with the Department's ATMS Developer, including any mutually agreed revisions during the Operations Period. The Express Lanes TMS shall be National Transportation Communications for ITS Protocol (NTCIP) compliant.

- C. The Developer shall develop and maintain a project-level ITS architecture that is coordinated with the Department's ITS architecture and the National Capital Region ITS Architecture. The project-level ITS architecture shall document all interconnects and information flows between the Express Lanes operations facility and the Department ATMS.
- D. The following requirements apply to Department Assets only.
1. The Developer shall establish weekly coordination meetings with the Department's networking staff throughout the duration of network design, installation, integration, testing, and configuration efforts. The Developer shall be responsible for designing, deploying, configuring, testing, and commissioning the network including network management and monitoring capability as approved by the Department. Prior to commencing work, the Developer shall develop a **Requirements Definition Document (RDD)** that will form the basis for the overall network architecture and design. The Developer shall work closely with the Department in developing the RDD to ensure compatibility and interoperability with the existing network. The RDD shall contain:
 - 1.1 Complete description of the proposed implementation of the access, distribution, and core layers for the Ethernet network;
 - 1.2 Development of an IP Design Scheme with ranges assigned to each node to be integrated by the Developer;
 - 1.3 Proposed IP subnet definition and addressing including any and all masks;
 - 1.4 Proposed IP multicast configuration including multicast routing (i.e., protocol independent multicast (PIM) sparse or dense) and Rendezvous Point (RP) designation as necessary;
 - 1.5 Proposed Recommendations for failover and redundancy including network device power, supervisor cards, and network ports;
 - 1.6 Proposed configuration and guidelines for Virtual Local Area Network (VLAN) assignments including management VLANs, device VLANs, and routing VLANs;
 - 1.7 Proposed configuration and guidelines for an IP gateway redundancy protocol such as Virtual Router Redundancy Protocol (VRRP), Hot Standby Router Protocol (HSRP), or Gateway Load Balancing Protocol (GLBP) shall be used to provide a redundant IP gateway in the event of primary gateway failures throughout the network.

- 1.8 Proposed configuration and guidelines for specific port assignments on each of the Layer 2 and 3 devices; and
- 1.9 Proposed interface and integration points with the existing ITS network.
2. The Department will provide the Developer with an IP address range or ranges to use for developing the IP address scheme. The RDD shall be prepared by a networking professional and approved by the Department. The networking professional shall be present during the installation and testing of the local area network as well as during system testing.
3. The Developer shall develop the Department Ethernet network consisting of Field Hubs (a.k.a. Nodes) located throughout the region connected via a fiber optic trunk. Field devices shall be connected to the Node sites via distribution fiber in a ring topology. Field devices shall be connected to the Layer 2 edge switch at each cabinet. A Layer 2 hardened switch at each Node facility shall act as the Ring Master.
4. The Developer shall install and secure the networking equipment in the field equipment cabinets and the MPSTOC as defined on the plans and in this document. Standards CAT 5E and optical fiber cables shall be used for each connection, as required.
5. Patch cables shall be defined as cables connecting a device to a patch panel, wall outlet, or another device. The patch panel provides a connection to permanently installed cabling generally.
6. The current Department Ethernet network consists of Field Hubs located throughout the region connected via a fiber optic trunk. Field devices are connected to the Hub site via distribution fiber in a ring topology. In the event any Hub sites are impacted by the Developer, the Developer shall be required to replace and relocate the impacted Hub sites subject to the Department approval of a plan that ensures continuity of operation.
7. The Developer shall design, furnish, and install a central terminus test system at the MPSTOC. The test system shall meet all the Department networking and security standards.

3.15.5 ETTM System Design Documentation

The following ETTM system design documentation shall be prepared and submitted to the Department by the Developer:

- A. Functional requirements - shall document compliance with the provisions of the I-66 Operations Concept Technical Report and shall include characteristics of the ETTM Equipment with regard to its intended capability, interface

requirements for operations, and system dependencies. The documentation shall describe the intended behavior and functionality of the ETTM systems and the operational interaction with the Department ATMS and other Stakeholders.

- B. Technical specifications - shall be a document or documents that specify the technical design of the subsystems, integrated systems, and system architecture that will comprise the ETTM System and its interfaces.
- C. Interface Control Document (ICD) - shall document all required interfaces between the ETTM system and other systems describing the physical and logical architecture of system interface between the systems, messaging protocols, file transfers, operations, redundancy, reporting and other aspects. Process definition deliverable or other agreed document shall set out the business processes relating to the ETTM System (subject to intellectual property regulations, and the requirements of the Agreement) and the processes for interacting with the appropriate Department system or other systems as required.
- D. Testing and Integration Strategy - shall establish the principles of, and the Developer's approach to, the testing and integration of the ETTM system and related interfaces, including the integration phases, test stages, test processes, conditions for moving from one test stage to the next and User Acceptance Testing by the Developer.
- E. Security Plan – shall be a document (or part of another document) that sets out how the security and privacy of the ETTM System shall meet the relevant requirements for enforcement evidence and that data are held securely and only accessible to authorized personnel. The Security Plan must comply with VDOT IIM LD236 on Critical Infrastructure Security.
- F. Disaster Recovery Plan – shall document the system design requirements and maintenance and operations procedures to be followed in the event of failure of the ETTM System. The Disaster Recovery Plan shall include redundant systems and equipment, recovery and rebuild procedures and business continuity attributes of the system such as remote access.

3.15.6 Design of the Electronic Tolling System

- A. The Electronic Tolling Collection (ETC) System component of the ETTM shall collect information from vehicles on the roadway to charge, collect and enforce payment of tolls in accordance with the Agreement.
- B. The ETC roadside system is comprised of at least the following in accordance with the Agreement:
 - 1. Transponder readers and antennas.

- 1.1 The ETC system shall maintain a transponder read performance of at least 99.99% under normal operation, for properly fitted and operating transponders, excluding signal attenuation due to metallic wind screen or other similar conditions beyond the reasonable control of the Developer;
- 1.2 The ETC system shall not assess a toll to vehicles, whether transponder equipped or not, traveling adjacent to any toll point in a lane (such as the general purpose lanes) that is not subject to a toll. Equipment (such as guard lane antennas), algorithms and manual review processes as necessary shall be implemented to ensure tolls are not charged to express-lane adjacent vehicles at least 99.99% of the time;
- 1.3 Transponders shall be associated with the correct vehicle 99.95% of the time; and
- 1.4 Transponder read processing shall be 4,000 per lane per hour.
- 1.5 The reader shall have the capability of buffering transponder reads in the event of a transaction processor failure.
2. Cameras to capture license plate(s).
 - 2.1 Cameras shall capture high resolution and quality images for day and night, and under all lighting and weather conditions.
 - 2.2 Camera image capture shall provide lighting necessary to meet the specified levels of performance regardless of ambient conditions, at the time of installation or in the future.
 - 2.3 Camera flash lighting shall not be visible to motorist travelling in either direction or be detectable by adjacent property owners.
 - 2.4 Cameras shall capture images from each vehicle at least 99.9% of the time;
 - 2.5 License plate images shall be human readable 99% of the time; and
 - 2.6 Image processing shall be 2,500 per lane per hour.
3. Optical Character Recognition (OCR) system.
 - 3.1 The OCR shall read license plates from Virginia, Maryland, District of Columbia, West Virginia, North Carolina, and Pennsylvania;
 - 3.2 The OCR shall automatically read the license plate characters and state jurisdiction at least 95% of the time from the states listed above;

- 3.3 The OCR shall be used to automate image processing; and
- 3.4 The OCR shall be capable of identifying "vehicles of interest" (Amber, Silver, or Homeland Security watch lists), and shall generate an alert to the Department.
4. Vehicle detection and classification equipment.
 - 4.1 The vehicle classification shall distinguish between motorcycles, 2-axle vehicles and large vehicles with 3 or more axles;
 - 4.2 The vehicle classification shall accurately classify vehicles 98% of the time; and
 - 4.3 The detection system shall have the ability to accurately detect each individual vehicle passing through a tolling point at least 99.9% of the time.
 - 4.4 The Developer may use a shape-based vehicle detection system, including video and laser technology, that will not require modifications to the pavement to classify and trigger transponder reads accurately.
5. Violation enforcement lights or other alerting system.
 - 5.1 Violation enforcement lights shall indicate transponders set in HOV mode.
 - 5.2 The Developer shall install an automated HOV enforcement technology for testing purposes. If the tests performed show successful results, the Developer will implement the automated HOV enforcement technology to automatically identify the number of occupants in a vehicle and generate an alert if the setting on the transponder is incorrect.
6. Roadside data collection system and transaction processor.
 - 6.1 Transactional data shall be collected for vehicles travelling between 0 mph and 120 mph;
 - 6.2 The roadside transaction processing system shall correctly correlate transponders and images to the correct vehicle 99.9% of the time;
 - 6.3 The roadside transaction processor shall buffer transaction for at least fifteen (15) days at the roadside in the event of network failure; and redundancy shall be provided in the event of transaction processor failure;

7. Related hardware, software and firmware to control the roadside ETC equipment.
 - 7.1 Switch and network components that connect the roadside ETC equipment to the wide area network and transfers data to the Developer's back office system (BOS); and
 - 7.2 The network shall transfer transaction data to the Developer's back office in near-real time.
- C. Access to the ETC system overhead and roadside equipment shall be provided such that it does not jeopardize the safety of the technician and travelling public.
- D. In the event of a need to temporarily suspend tolls for any toll section, there shall be a means to suspend toll collection on a section by section basis, and the system shall continue to record transaction data while tolls are suspended.
- E. The ETC roadside equipment shall have an In-service Availability (ISA) of at least 99.5%, excluding the effect of any condition beyond the reasonable control of the Developer.
- F. The Developer shall establish and execute a process to determine vehicle occupancy and undertake related enforcement.
- G. The Developer shall develop and update, as needed, any additional interface file format and transfer protocols for the transmission of ETC data and related information in cooperation with the Department and in accordance with the ETC Agreement over the term of the Agreement.
- H. Communication between the ETC system roadside equipment and the operations facility shall be via a fully redundant network.

3.15.7 Design of the Technical Shelters

- A. The Developer shall provide suitable technical shelters housing electrical cabinets for the relevant ETTM Equipment as needed to meet the requirements of the Agreement.
- B. The technical shelters shall be equipped with the following provisions:
 1. HVAC systems as required for installed equipment;
 2. Fire/smoke detection;
 3. Intrusion detection;
 4. Video surveillance;

5. Electrical power; and
 6. Communications.
- C. Each service panel for the Project technical shelters shall be capable of monitoring and reporting alarms for the main power and each branch circuit, the current flow and any tripped breakers.
 - D. Each technical shelter shall be powered by an uninterruptible power source to enable any telemetry to communicate for the first 4 hours after a power failure.
 - E. Service panels feeding technical shelters shall be equipped with a backup generator sized to accommodate the attached electrical load and any other roadside equipment, including DMS, connected to the service panel until power is restored.
 - F. The technical shelter structural design, including floor, shall be designed and constructed giving consideration to its life cycle. Allowable design bearing capacities shall be established to minimize shelter foundation settlements and associated settlement cracking. These capacities shall be field verified by the Engineer prior to construction. Consideration shall be given to making the floor slab integral with the wall foundation system.
 - G. Access to technical shelters shall be provided such that it does not jeopardize the safety of the technician and travelling public.

3.15.8 Express Lanes Traffic and Toll Operations Centers

- A. The Developer shall provide a Traffic Operations Center to accommodate equipment and personnel for the traffic management operation of the Project. The Developer shall obtain building permits and other approvals as required by Law, for the construction and occupancy of the Traffic Operations Center as required.
- B. The Traffic Operations Center shall be the minimum required to monitor traffic, respond to incidents, and perform all other duties as required under the Agreement.
- C. The Traffic Operations Center shall be located in the Northern Virginia District.
- D. The Developer shall provide a Toll Operations Center, which may be the same facility as the Traffic Operations Center, where staff responsible for reviewing license plates, handling customer service, and all other duties required for the tolling operations will be located.
- E. The Toll Operations Center shall be located in the Commonwealth of Virginia, but it need not be located in the Northern Virginia District, and toll operations

support services may be provided from outside the Commonwealth of Virginia. At Handback, or any early termination of the Agreement, toll operations support services shall be integrated with the Department's existing back office operations or relocated to the Commonwealth of Virginia.

- F. Both the Traffic and Toll Operations Centers shall comply with the Department's physical security requirements.
- G. The Traffic Operations Center shall be fully interoperable with the MPSTOC.

3.15.9 Closed-Circuit Television (CCTV) Cameras

- A. Dedicated CCTV cameras shall be provided by the Developer for surveillance of the Express Lanes including, approaches and interchanges.
- B. CCTV video coverage must be provided by pan, tilt, and zoom (PTZ) equipped cameras mounted on poles to enable the Department and Developer 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.).
- C. CCTV spacing and line-of-sight distances shall be optimized to provide full video surveillance coverage without image degradation.
- D. All cameras installed by the Developer shall meet the requirements of VDOT Road and Bridge Specifications, as included in Attachment 1.5.
- E. 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.
- F. The video provided must be stable at all zoom settings when viewing objects up to one mile away.
- G. The following requirements apply to Department Assets only.
 - 1. The Developer shall furnish and install High Definition (HD) closed circuit television (CCTV) color cameras to replace existing VDOT units and provide full overlapping video surveillance coverage of general purpose lanes. The CCTV cameras shall produce clear, detailed, and usable video images of the areas, objects, and other subjects visible from a roadside CCTV field site. The video produced by the camera shall be true, accurate, distortion free, and free from transfer smear, over-saturation, and any other image defect that negatively impacts image quality under all lighting and weather conditions in both color and monochrome modes. The camera enclosure shall minimize glare and provide overexposure protection for the camera when pointed directly at the sun.

2. The camera shall provide tilting, masking, presets, and privacy zones capable of being superimposed on video image/stream and stored in non-volatile memory.
3. The CCTV camera shall include an integrated PTZ mechanisms capable of providing 360 degree continuous pan, presets, programmable tours, and blackout privacy zones.

3.15.10 Vehicle Detection Systems (VDS)

- A. The Developer shall furnish to the Department vehicular traffic data consisting of travel time, volume, speed, and occupancy between all interchanges and at all on and off ramps to general purpose lanes. The traffic data shall be delivered live every minute to VDOT ATMS and will be used for traffic management, studies and archived for sharing with others at the Department discretion. The data shall be collected by microwave vehicle detectors installed every one-half mile or by the use of other approved technology with similar functionality.
- B. The Developer shall deliver live vehicular traffic data consisting of travel time, volume speed, and occupancy from the Express Lanes and all on- and off-ramps to the VDOT ATMS at MPSTOC to be used for traffic management, studies and archived for sharing with others at the Department discretion.
- C. The Developer shall measure and furnish quantitative traffic flow data to the Department for both the Express Lanes and the general purpose lanes. The data shall be provided for each lane. This shall consist of average vehicular speed, traffic volume, sensor occupancy, and travel time.
- D. The Developer shall provide the Department real-time access to available general purpose lanes data obtained from VDS installed on the Express Lanes, for which the Developer is responsible for operation and maintenance.
 1. Under this option, all data and performance requirements in the Department's VDS specification shall apply. The data will be subject to annual testing by the Developer to ensure data accuracy and calibration for the Term.
 2. Data shall be provided for all general purpose ramps and lanes including all shoulders.
 3. The real-time feed shall be accessible to VDOT ATMS via a non-proprietary, published, open Application Program Interface (API).
 4. All data will be archived and shared with others by the Department.

5. The Developer shall furnish an Interface Control Document defining the real-time and archived data interfaces, which shall be subject to the Department review and approval.
- E. The Developer may recommend other options to provide the Department a real-time data feed (at a maximum of one minute intervals) for the general purpose lanes subject to Department approval.
 - F. The Developer shall provide the Department a real-time data feed of traffic flow data on the Express Lanes.
 1. All data and performance requirements in the Department's specification for vehicle detection and data collection shall apply. The data will be subject to annual testing by the Developer to ensure data accuracy and calibration for the Term.
 2. Data shall be provided for all Express Lanes ramps and lanes including all shoulders.
 3. The real-time feed shall be accessible to the Department's central software via a non-proprietary, published, open API.
 4. All data will be archived and shared with others by the Department.
 5. The Developer shall furnish an Interface Control Document defining the real-time and archived data interfaces, which shall be subject to the Department review and approval.

3.15.11 Dynamic Message Sign (DMS)

- A. Two (2) toll and driver information (T&DI) DMS for the Express Lanes shall be located prior to each entry to the Express Lanes and will display information to allow drivers to make decisions on whether to use the Express Lanes. The information to be displayed shall indicate:
 1. Toll rates for up to three major destination points for each point of entry; and
 2. Roadway information such as accident locations or weather alerts.
 3. The first sign may be used for pricing information or advisory information. The second sign shall be dedicated to pricing information.
- B. Three (3) T&DI DMS for the Express Lanes shall be installed at suitable distances from all entry points, the Express Lanes main entry points at each end of the corridor, and prior to each toll zone within Express Lanes as needed to

match tolling scheme, to support motorist decision making, and to maintain orderly movement of traffic.

1. The first sign shall be used for pricing or advisory information.
 2. The second and third DMS shall be dedicated to pricing information and shall consist of an advance and confirmation pricing sign; and
 3. The advance pricing sign shall give the first notice of the toll rates for the roadway and the confirmation sign shall give confirmation of the toll rates.
- C. The Developer shall coordinate the location of DMS with the Department to avoid over-populating signs and to seek shared gantry installation opportunities. The Developer shall provide a Project Roll Plan that will be used to identify sign clutter concerns and potential gantry sharing opportunities. The Developer shall incorporate agreed upon recommendations in the final Design Documentation.
- D. The T&DI DMS shall have the following minimum features:
1. Full matrix color LED display (signs dedicated to pricing may be monochrome);
 2. Capability to display congestion levels on Express Lanes on each tolling section;
 3. Capability to display toll price for destination points;
 4. Capability to display travel time information for Express Lanes and general purpose lanes;
 5. Capability to display traffic management information, including warning and recommended diversions;
 6. Fault detection and reporting; and
 7. Conformance to the National Transportation Communications for ITS Protocol (NTCIP) communications protocol v2.35 and backward compatible with the Department's current version 1 of the NTCIP protocol.
- E. If communication with the Developer's Traffic Operations Center is lost and the T&DI DMS has no reported errors, the T&DI DMS shall display a user-defined locally stored graphic/message.
- F. The Traffic Management DMS shall be installed on the Express Lanes before every exit point to provide traffic management information and travel time to motorists.

- G. The Traffic Management DMS shall be Type 1 signs according to VDOT's standard provisions and have the following minimum features:
1. Full matrix color LED display;
 2. Capability to display traffic management information, including travel times, warnings, recommended diversions, and graphics;
 3. Fault detection and reporting; and
 4. Conformance to the NTCIP communications protocol.
- H. The following requirements apply to Department Assets only.
1. Two types of DMS units shall be used for the general purpose lanes. Type 1 DMS shall consist of both walk-in and front-access sign assemblies, and Type 2 DMS shall consist only of front-access sign assemblies. Walk-in Type 1 DMS units shall only be installed on span structures and front-access Types 1 and 2 DMS units shall be installed on either span or butterfly structures.
 2. Displays shall be full color matrix with evenly spaced pixels, both vertically and horizontally providing for an 18 inch high character for Type 1 and for 12 inch high character butterfly mounted Type 2 DMS units. Each sign shall be capable of displaying a message composed of any combination, upper and lower case letters A through Z, decimal digits 0 through 9, blank or space, punctuation marks, special characters, special graphics shapes editable by the user.
 3. The DMS controller and circuit breaker shall be installed on the ground in the equipment cabinet, not overhead within the DMS assembly. The DMS controller software shall support NTCIP V2.35 and shall be backward compatible with the Department's current version 1 of the NTCIP communication protocol and the functions and features contained within the VDOT ATMS.
 4. DMS shall be installed at the following minimum locations:
 - 4.1 Type 1 walk-in sign between interchanges;
 - 4.2 Type 2A sign prior to decision point to Express Lanes; and
 - 4.3 Type 2 sign for P&R lots.

3.15.12 Cabinets

- A. The Developer may choose type and locations of cabinets used to house Express Lanes power, communication, traffic management and tolling equipment.

B. The following requirements apply to Department Assets only.

1. The work shall consist of furnishing and installing field equipment cabinets consisting of cabinet enclosure and associated ancillary items. All cabinet installations shall be ground-mounted on concrete foundations in accordance with VDOT Road and Bridge Standards CF-3.
2. For testing, maintenance, and repair purposes, all equipment cabinets shall be installed within 100 feet of all messaging devices such that the front face of the device is visible from the cabinet for maintenance purposes.
3. Power components which include transformer distribution and disconnect panels may be located outside the cabinet on ground mounted metal frame that is 36 inches minimum above finish grade with 36 inches square concrete Technician pad.
4. Field equipment cabinet are used for housing ITS equipment, and network devices including, but not limited to, Ethernet switches, device and terminal servers, digital video encoders, CCTV interface panels, DMS controllers, vehicle detector interface assemblies, transient voltage surge suppressors, uninterruptible power supply system, solar power controller and charging equipment, and fiber optic cable termination and patch panels.
5. The Developer shall furnish and install grounding system and primary transient voltage surge suppression (TVSS) to protect all equipment from lightning, transient voltage surges, and induced current including service entrance or main disconnect in accordance with Department Standards, Specifications and Special Provisions set forth in Attachment 1.5.
6. Access to and location of field equipment cabinets shall be on level grade with a minimum 4-foot-wide level surface around the cabinet and provided such that it does not jeopardize the safety of the technician and travelling public and comply with the standards and specifications set forth in Attachment 1.5.
7. The Developer shall provide five prints of the controller circuit diagram. The prints shall be produced from the original drawing and shall be clear and legible. The Developer shall install two copies of the circuit diagram inside the cabinet in a readily accessible waterproof enclosure and shall furnish three additional copies to the Department. The waterproof enclosure shall be securely attached to the cabinet with studs welded to the cabinet and nuts. The enclosure shall have noncorrosive metal grommets for use with the studs.

3.15.13 Power

- A. The Developer shall furnish and install a dedicated power distribution network for the Express Lanes tolling system, which shall be physically separate from the Department's power distribution network.
- B. The Developer's power distribution network shall consist of dedicated conduits, handholes, conductors and power service meters.
- C. Power for the Developer's non-toll-related traffic management devices may be shared with the Department subject to a mutually agreed upon sharing formula.

3.15.14 Back-Up Power System

- A. All tolling points shall have an uninterruptible power supply (UPS) that supports the equipment in the event of a power outage for at least 1 hour.
- B. A UPS assembly shall provide complete non-interruptible power protection, voltage regulation, and surge and spike protection for all devices and communications equipment powered by it. The UPS shall instantly transfer the cabinet to the battery back-up mode in the event the main AC power source goes offline. The UPS shall be a commercially available package containing all wiring connectors, software, mounting brackets, and cables. The UPS assembly shall consist of a UPS with batteries, surge suppression, LED status indicators for "On-line," "Battery On," "Replace Battery," and "Overload," customizable output relays and input contacts, and network management cards (IP addressable).
- C. The UPS shall include remote monitoring and control functions with a software and firmware package that is web-based and, at a minimum, provides the ability to determine in real time the status of the commercial power (on-off), backup power (on-off), the duration of available UPS backup battery time at the rated UPS load (hours and minutes), and any errors.
- D. The UPS shall be of sufficient design to fully operate all devices and communications equipment it powers for a minimum of four (4) hours. Additionally, the Developer shall be responsible for providing a portable generator hookup where power demand and cabinet constraints outweigh minimum four (4) hour battery runtime capacity subject to Department approval.

3.15.15 Communication and Power Infrastructure

- A. The Developer shall install a power and communication conduit system, with conduits allocated for the Express Lanes system and the Department's system.

1. The duct bank shall consist of six 4-inch underground conduits exclusively for VDOT, two for power and four for communications cable.
 2. The duct bank may be placed within or beneath median barrier.
 3. The duct bank shall be encased in concrete, with maintenance access points provided.
 4. The Developer's conduit shall be separate from VDOT's conduit.
 5. Crossings of I-66 for the Department's communication and power conduit systems shall consist of two 4-inch underground conduits midway between interchanges and two additional 4-inch conduits at every new bridge crossing I-66 within the project limits.
 6. The Developer shall be responsible for testing and ensuring that vacant conduits are unblocked, have tracer wires, and pull ropes.
- B. The existing communications infrastructure shall remain continuously operational during construction or temporarily replaced unless written approval is provided by the Department.
- C. Communication redundancy between the ETTM Equipment and the ETTM facilities shall use the Developer's fiber network within the project limits.
- D. The Department will provide two single mode fiber optic cable strands beyond the project limits for the Developer's use in building a redundant communications network architecture for the Express Lanes.
- E. The Developer's fiber optic network infrastructure shall be separate from VDOT's network.
- F. The Developer shall provide fiber optic network connectivity to provide communication between the Express Lanes Traffic Operations Center and one of the following facilities:
1. The McConnell Public Safety and Transportation Operations Center (MPSTOC)
 2. The Department's backup ATMS located at the Traffic Operations Building on Mason King Court, Manassas, VA.
- G. The Developer shall construct the replacement duct-bank between the edge of pavement and the edge of the right-of-way so that all junction boxes are accessible without blocking travel lanes or shared use paths.

- H. All backbone duct-bank conduits shall be placed a minimum of 36 inches from the edge of the pavement, encased in concrete with 6-inch cover all around at a minimum depth of 36 inches below finish grade.
- I. The backbone duct-bank shall have separate access points for fiber and power every 2,000 feet typical. All duct-bank including vacant conduits shall be furnished with tracer wire, pull rope, rodent plugs, and bell-ends on every raceway.
- J. Fiber communications, network and power infrastructure shall have **rodent prevention measures** in place to eliminate access to fiber cables, electrical cables, junction boxes, service panels, cabinets and technical shelters.
- K. All duct banks shall include **Utility RFID Marker Balls and Pegs**, subject to Department standard provisions.
- L. Aerial and or direct buried fiber shall not be permitted. Fiber optic cable shall be installed separately and shall never intermingle with **power conductors in pull boxes, manholes, junction boxes, vaults, or conduit. Fiber optic cable shall only be terminated at cabinet termination and patch panels and devices with no splicing permitted in either pull boxes or vaults.**
- M. The following requirements apply to Department Assets only.
 - 1. The communications network on I-66 has service devices on that corridor and is also part of a redundant ring providing fault tolerance for all of the Department's ITS freeway management system assets on Interstates in the region. It is vitally important that this network be preserved at all times during construction and that it be **enhanced** as part of the project. All conduit, fiber optic cable, handholes, and networking equipment shall meet or exceed the Department specifications.
 - 2. The Developer shall preserve the integrity and functionality of the Department's fiber optic cable, conduit and junction boxes during all phases of construction.
 - 3. The Developer shall install minimum **96 backbone and 36 distribution** fiber exclusively for the Department. In addition the Developer shall replace in-kind existing fiber for WMATA, Army Corp, and other entities in the existing Department's duct-bank.
 - 4. It is intended that the Department and its partner agencies have separate conduit for their respective fiber networks. The Developer shall coordinate the conduit distribution during the design and submit for Department approval.

5. The 96 strand fiber backbone cables shall have full splices at the intervals no less than 15,000 feet and no greater than 25,000 feet or as approved by the Department.
6. Switchover to the new fiber optic network shall be performed with minimal disruption to the network. Disruptions shall not exceed six (6) hours, shall require at least 48 hours of notice and shall require preapproval from the Department. Disruption is defined as a loss of connectivity in any cable strand at any location in the project area.
7. All field cabinets must be directly connected to the fiber optic network. No other media may be used for last-mile communications (e.g., wireless, copper). This applies to devices on both general purpose lanes and Express Lanes.
8. Fiber drop cables to field cabinets shall be factory pre-terminated (non-mechanical splices) with a pigtail for fusion splicing into the closest splice enclosure.
9. All fiber splices shall be fusion (mechanical will not be allowed) and shall be located inside waterproof splice enclosures that accommodate a minimum of 6 cables.

3.15.16 Design of Developer Back Office System

- A. The back office shall perform the following functions:
 1. Transaction processing of roadside data to be filtered into transponder-based, image-based and unknown transaction types;
 2. Trip building or other methodology for identifying transactions related to single vehicles travelling in one direction for consecutive toll points in a reasonable timeframe;
 3. Trip rating based on dynamically calculated rates associated with look-back times to ensure customers are charged the rates they see on the sign;
 4. Image processing by automated means based on OCR performance levels;
 5. Image review for images with no known license plate read or an OCR with low confidence threshold; and
 6. Violation processing of trips that are not associated with known E-ZPass accounts.
- B. The violation processing system shall interface with a mail house, collections agency and courts in project jurisdiction.

- C. The back office shall interface with banks for payment receipt.
- D. The back office shall interface with the VDOT Customer Service Center (CSC) for interagency transaction clearing.
- E. The back office shall interface with the Department or with any other applicable third parties to provide for look-up services from the Virginia Department of Motor Vehicles (DMV) and any other applicable out-of-state motor vehicle authorities.
- F. The Developer shall ensure that the ETTM System has sufficient data processing capacity.
- G. Databases shall be scalable for additional capacity to be added in the future.
- H. The customer service module shall allow customer service representatives to access the system for account management and violations payment processing.
- I. The BOS shall allow remote access to the system by an off-site customer service center and off-site image review center.
- J. The BOS shall have a website for customers to view roadway information, make violation payments, and communicate with customer service representatives.
- K. The back office shall have a reporting system that generates automated reports and allows for ad-hoc queries of the system.
- L. Automated reports shall include, but not be limited to, transactions per hour/day/month, revenue for a selected timeframes, list of transponders and license plates, system health and performance and system access logs.
- M. Trip Records
 - 1. The Developer shall track, verify and reconcile all trip records at every point in the back office solution.
 - 2. The Developer shall report on individual and summary transaction disposition and aging for each transaction that occurs at the roadside for a given time period.
 - 3. The Developer shall ensure all contiguous tolling detection points in a single travel direction are incorporated into a single trip record 99.95% of the time.
 - 4. The Developer shall design back office systems such that trips with a definitive start and end point, consistent toll point transaction data and

transponder data are submitted to the CSC for posting within 24 hours of construction of that trip.

- N. The dynamic pricing system shall:
1. Receive data gathered from VDS on the roadway reporting traffic volumes, lane occupancy, and speed data at all detection points;
 2. Change toll prices according to a defined pricing algorithm;
 3. Send toll rates to the TMS for display on DMS;
 4. Have the ability to change toll rates in increments (with a configurable minimum interval of 3 minutes); and
 5. Adjust toll prices in order to maintain free-flow traffic condition in accordance with the Operating Speed Performance Standard (OSPS) and FHWA regulations as defined in the Agreement.
- O. The Developer shall conform to business rules, operate the ETTM system, receive and process status files and communicate toll charge transaction information in compliance with the current version of the following:
1. Discount Plan Interface: Virginia Toll Facilities Group – VDOT CSC Specifications;
 2. Toll Corrections File Interface: Virginia Toll Facilities Group – VDOT CSC Specifications;
 3. Toll Reconciliation Response File Interface: Virginia Toll Facilities Group – VDOT CSC Specifications;
 4. Transponder – Account Number File Interface: Virginia Toll Facilities Group – VDOT CSC Specifications;
 5. Virginia Department of Transportation E-ZPass Service Center (Black Box) Interface Specifications; and
 6. VTOLL Interface: Virginia Toll Facilities Group – VDOT CSC Specifications.

3.15.17 Interface with the VDOT ATMS

- A. The interface shall be fully interoperable with the VDOT ATMS.
- B. The interface with the VDOT ATMS shall comply with the requirements of the ICD NTCIP C2C Standards, the Traffic Management Data Dictionary (TMDD).

- C. The Express Lanes TMS shall not affect any change to the VDOT ATMS or the procedures for the operation and maintenance of the VDOT ATMS unless otherwise required by the provisions of the Technical Requirements and the ICD.
- D. The ETC and TMS shall not cause any unscheduled interruption or adverse effect to the continued functioning of the VDOT ATMS or the operations supporting it.
- E. The VDOT ATMS shall not cause any unscheduled interruption or adverse effect to the continued functioning of the ETC and TMS or the operations supporting it.
- F. The ETC and TMS shall be capable of being electrically (and, where relevant, optically) and mechanically isolated from the VDOT ATMS.
- G. The Developer shall:
 - 1. Provide external electronic interfaces between the ETC and TMS and the VDOT ATMS in accordance with the ICD;
 - 2. Work with the Department and its subcontractors to construct, test, and operate all specified interfaces; and
 - 3. Prepare and document the designs as outlined in the Agreement, which may include but not be limited to the following:
 - 3.1 The content of the data to be exchanged;
 - 3.2 The format of the data to be exchanged;
 - 3.3 The static data which are required to decipher the meaning of the data exchanged;
 - 3.4 The bearer protocols to be used;
 - 3.5 Any sequencing constraints or assumptions;
 - 3.6 Error handling measures;
 - 3.7 Measures to ensure data integrity;
 - 3.8 The nature of testing and the associated test data to be used; and
 - 3.9 Any other information necessary for the interface to operate correctly.

- H. The TMS shall have a mechanism to control the rate of transmission of messages/file to the VDOT ATMS, with such mechanism being mutually agreed to and in accordance with the ICD.
- I. If the interface to the VDOT ATMS is unavailable, the TMS System shall be able to store relevant records for an agreed period of up to five (5) days on secure media and transmit them to the VDOT ATMS once the interface is restored.

3.15.18 Data Processing Capacity

The Developer shall ensure that the ETTM System has sufficient data processing capacity. The system shall maintain online real-time access to transponder transactions and corresponding images for at least twelve (12) months or as otherwise defined by the ETC Agreement. Violation data and images shall be maintained according to legal statute of limitations, Code of Virginia Purge requirements and to ensure detailed information on the violation including transaction, customer communication and relevant images is available for research for 18 months unless subject to any legal requirements in conflict with this requirement.

3.15.19 Alarm Reporting

The ETTM System shall have the capability to monitor and document the status of all relevant components and to raise alarms in the event of component failure, performance degradation, or any other potential issues that might adversely affect the operation or performance of the ETTM Equipment. Where such alarms relate to equipment that is critical to the accuracy of toll charges or violation enforcement actions, such alarms shall be used to determine period of questionable toll activity so that accuracy can be verified manually to use preset toll, apply appropriate transactions discounted, or written off.

3.15.20 Data Security for Operation Center

- A. The Developer shall prepare and submit no later than six months prior to Project Completion to the Department a security plan for the Express Lanes operations.
- B. The Security Plan shall embody the following key principles for the protection of data:
 - 1. Integrity: Data shall be protected from being corrupted by unauthorized changes, whether by system error, human error, or intentional alteration. Data shall only be modified by authorized users according to defined privileges and procedures. However, no data shall be deleted from the system in this process.

2. Confidentiality: Data shall be protected from unauthorized disclosure. Access to systems shall be restricted to authorized users with privileges appropriate to the confidentiality of the data. E-ZPass customer data shall be subject to at least the same privacy and confidentiality requirements as established by the Department for its E-ZPass customers.
 3. Availability: Data shall be prevented from being lost or becoming inaccessible. Authorized users shall be able to gain access to information to which they are privileged whenever they are authorized to do so.
- C. All system access rights by operators shall be logged and maintained, including date, time, and duration.
- D. Passwords shall be changed by end-users every 3 months.
- E. The system shall conform to PCI standards.
- F. Remote access to the system shall be limited to users that maintain critical functions of the system.

3.15.21 Disaster Recovery

- A. The Developer shall prepare and submit no later than six months prior to Project Completion to the Department a Disaster Recovery Plan for the Express Lanes operations, which shall, at a minimum, include the following:
1. Mitigating any adverse impact on the Tolling System and its operation and TMS, in any circumstances where the ability of the Developer to provide the operation of the Tolling System would otherwise be impaired; and
 2. Making provisions for action to be taken by the Developer in the event of the unavailability of its premises.
 3. Initiation triggers, notifications, resources, protocols, personnel, and periodic plan test.
- B. The Disaster Recovery Plan shall identify the measures to be taken in the event of:
1. Operations Center site loss;
 2. Roadside equipment site loss;
 3. System data loss or corruption;
 4. Systems failure;
 5. Failure of the communications link with the VDOT ATMS;

6. Failure of the communication links between the roadside equipment and the Operations Center;
 7. Loss of power in the locality; and
 8. Inability of staff to gain access to, or work effectively at, the Operations Center.
- C. The Disaster Recovery Plan shall include recovery and re-build procedures.
- D. The Disaster Recovery Plan shall indicate the location of equipment manuals and recovery procedures.
- E. The Disaster Recovery Plan shall indicate the location of all system design and architecture documents as well as as-builts.
- F. The Disaster Recovery Plan shall be exercised at 1-year intervals.

3.15.22 Incident Management

- A. The Developer shall design and construct CCTV cameras at a quantity and spacing necessary to achieve full visual coverage of all general purpose lanes. This shall be defined as follows:
1. The CCTV surveillance system shall offer an uninterrupted view of the roadway with sufficiently high resolution to enable the identification of a vehicle's color, make and model (make and model to be identifiable by the shape of the vehicle performed by a person familiar with such characteristics) at any point on the roadway (assuming sufficient or daytime lighting levels).
 2. The above does not imply that the entire road network must be viewable at the same time. For example, the use of PTZ cameras to zoom into specific portions of the road, and thereby causing other portions not to be viewable at the same moment in time. Blind spots where visibility by CCTV is not available or is obscured by other stationary objects such as overhead sign panels, a bridge over pass, or trees is unacceptable.
- B. Continuity of operations is critical during construction. To that end, the Developer shall maintain CCTV cameras continuously operational unless an acceptable replacement portable CCTV camera is provided.
- C. The Developer shall implement an Automated Traffic Management System to detect incidents and instantly notify Traffic Operations Center staff with alerts that are prioritized according to severity level.

3.15.23 Testing

- A. The Developer shall submit to the Department a test strategy for the Express Lanes that shall include as a minimum:
 1. The scope, requirements and objectives of testing;
 2. An overall high-level plan for testing the ETC and TMS, including the test stages and processes and the scheduling of all tests prior to the Project Completion Date; and
 3. The roles and responsibilities of all those involved with the testing program and any dependencies on third parties, including Department personnel.
- B. 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 will use:
 1. A Verification Cross Reference Index (VCRI), which will be developed and documented to establish the way in which requirements are satisfied. The VCRI shall use test, demonstrate, inspect and analyze as methods for acceptance;
 2. A test series that shall demonstrate compliance with the performance requirements through a test plan and procedures;
 3. 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
 4. 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:
 - 4.1 Test specifications for each of the test cycles.
 - 4.2 Detailed requirements traceability matrix linking each of the test series to relevant requirement(s).
 - 4.3 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.
 - 4.4 Checklist consisting of item being tested, expected result, pass/fail, remarks, list of deficiencies and signatures.

5. The testing strategy for the Express Lanes will provide the level of detail to ensure compliance with the overall testing requirements. This testing strategy shall include:
 - 5.1 System design and integration overview.
 - 5.2 User Acceptance Testing (UAT) – 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 (30) days before service commencement of the ETTM. The Department will approve successful completion of the UAT for service commencement.
 - 5.3 Factory Acceptance Testing – tests to be conducted at the supplier’s premises prior to delivery to verify that the equipment, subsystem or system complies with the functional and performance requirements of that supplier’s subcontract.
 - 5.4 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.
 - 5.5 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.

C. The following requirements apply to Department Assets only.

1. Inspection, integration, and testing involve a three-tier sequential process that consists of Stand Alone Functionality, System Operation, User Acceptance Testing and System Burn-In Test.
2. Stand Alone Testing requires field acceptance at device and cabinet level. System Operational testing requires acceptance at communication hub and Traffic Management Center (TMC) levels. User Acceptance Testing shall successfully demonstrate that users at the TMC can fully control all aspects of the Intelligent Transportation System. System Burn-In Test requires continuous operation of the system without major or catastrophic failure for thirty (30) consecutive days which must occur prior to issuance of Project completion certificate (C-5). The Developer shall make arrangements for the witnessing of tests by the Department staff or representatives by sending notification seven (7) days prior to scheduled test.

3. The Developer shall be responsible for establishing and executing a plan for inspecting, integrating, and testing of all infrastructure and device components furnished and installed by the Project. The QAM shall be responsible for ensuring that the inspection, integration, and testing plan established by the Developer and approved by the Department is properly executed, variances are reported and corrective actions are made.
4. The Developer shall supply written test procedures for Department approval a minimum of thirty (30) days before testing can be started. The Developer shall submit reports for all testing levels to verify procedures followed, results recorded, timetable, and action required. The testing report shall include relevant information such as calibration data of all test equipment, charts, graphs, evidence, photographs, failure analysis, corrective action, traceability and audit trail, with certification signature of QAM.
5. The Developer shall submit a schedule for System Burn-in test that shall be performed over a thirty (30) consecutive day period under real-world operation conditions without system failure. The system shall not lockup, fail, or crash due to use, operator entry of data, or equipment malfunction during the thirty (30) days. Operators will record any deficiency as it occurs and the Department may employ a third-party to inspect the system and record any deficiencies. Any failure of Developer supplied equipment or discovery of deficiency that causes a system failure shall be cause to halt and repeat the System Burn-in test in its entirety for another full 30-day period after correction of the deficiency.
6. During System Burn-in Testing, the Developer shall respond to any issues within 4 hours of notification from the Department. All repairs shall be completed within 48 hours, with the exception of communication failures that shall be completed within 24 hours.
7. The Developer shall provide manufacturer's warranties on all furnished equipment for material and workmanship that are customarily issued by the equipment manufacturer. The warranty period shall commence from successful completion of the User Acceptance Testing.
8. Upon the completion of device integration, the Developer shall demonstrate full functionality of all required features for all installed field devices using vendor supplied software. The testing shall take place at the PSTOC on the Department network for devices on the general purpose lanes. The Department shall review and approve the device configuration settings for compatibility with its VDOT ATMS prior to the commencement of testing.

9. The Developer shall coordinate and support the Department's TMC contractor to integrate the devices with its VDOT ATMS and updating any configurations as necessary.

3.15.24 Training

The Developer shall develop and conduct separate information sessions for the Department in the operations and maintenance of the Express Lanes ETTM and assets installed for the Department.

- A. The target audience for one information session shall be the Department's management staff and duty officers. The session shall include an overview of the capabilities and procedures used to operate the Express Lanes.
- B. The target audience for one information session shall be the Department's TOC operators and controllers and shall include detailed daily procedures used by the Express Lanes TMS in interface with the NRO MPSTOC and management of incidents.
- C. The Developer shall also conduct a minimum 1-day training on the operation and maintenance of all assets installed for the Department's field staff which may include contract personnel.
- D. Training shall be held for all operations staff on their relevant modules to the extent the operator is tested and is competent and understands the system before operations.
- E. Maintenance staff shall be trained on all devices including recovery and re-build procedures and disaster recovery on assets installed for the Department.
- F. Maintenance staff shall be trained to diagnose basic issues and faults in the system on assets installed for the Department.
- G. Refresher training shall be held once per year on new facets of the system modules.

3.15.25 Integrated Corridor Management

The Developer shall provide real time Express Lanes travel time, pricing, and incidents information via Center to Center interface to the Department for development and use in Integrated Corridor Management.

3.15.26 Notification of Impact (NOI) to Department Assets

- A. 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 Developer by the Notification of Impact (NOI) to the Department.

- B. 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 Developer’s construction activities.
- C. The Work shall be governed by the general requirement that the impacted Department Assets shall be maintained or returned to a condition equal to 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.
- D. 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 Developer 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 for changes by the Developer or the Department may be denied without good cause.
- E. 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 that the elements of the system can be verified as to precise location and operational status. The Department and the Developer shall work together to identify and coordinate those items that could not be addressed during design.
- F. The Department and the Developer 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 Developer.
- G. "Impact" is defined as any work that will interrupt the normal operation of the Department's Assets.

- H. 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.
- I. The Developer 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.
- J. The Department will make staff available upon request to assist the Developer 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 will make staff or authorized representatives available within forty-eight (48) hours of Department receipt of the Developer's written request.
- K. 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 Developer shall follow the typical construction processes (RFI, FDC, etc.) to identify and resolve the impact.
- L. The Department will notify the Developer of any impacts to operations that may be attributable to work at other sites that were not anticipated in the original notification. The Developer and the Department shall coordinate as necessary for unanticipated impacts to operations.
- M. 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 Developer. Means and methods shall be consistent with the requirements of the Agreement, the Standards and Specifications, and Good Industry Practice.
- N. With the exception of the notification form, written correspondence described in this Exhibit 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.
- O. Responsibility for maintenance of impacted Assets shall transfer to the Developer 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 Developer, events outside the control of the Developer that impact the condition of the Assets shall be addressed by the

Department including warranty claims and at-fault third parties. The Department shall be notified immediately of any damage to existing Assets.

- P. The Developer shall be required to submit an amended NOI if work described in initial notification is performed at least forty-eight (48) hours after date stated in the NOI form.
- Q. The Developer shall document all changes to Department infrastructure as a result of work in the NOI in the Project as-built plans according to the as-built plans set forth in the Technical Requirements. The as-built plan will be required for all impacted Department Assets even if such Asset is not shown on Project design plans.

R. Notification Procedure

1. First Notification: 21 Days Prior to Work Start

The Developer shall submit a complete Notification of Impact to Department TMS Asset form to the Department. The form shall be provided a minimum of twenty-one (21) calendar days prior to the proposed start of the Work impacting the Asset.

2. Notification Review: 18 Days Prior to Work Start

The Department will review the form for conformance with the plans and the Agreement. Within 3 days of receipt, the Department will respond to the submitted form. The Department will provide one of three responses: **Approved** – The form is found to be in conformance with all documented requirements and is approved as submitted. The process moves to the Inspection phase.

Revise and Resubmit – The form is conditionally approved with minor corrections or clarifications required as noted in the Department’s response. The process moves to the Inspection phase and the Developer revises the form as needed for resubmittal prior to the second notification

Rejected – The form has significant elements that are not in conformance with the plans or the Agreement. The Department notes the specific elements of the form not in conformance and cites the controlling Agreement requirements not met. The Developer shall submit the form again beginning at the first notification.

3. Inspection: 14 Days Prior to Work Start

Following approval or conditional approval of the notification form, the Department and the Developer shall conduct a joint field meeting at the Asset to be impacted. The Department will provide the Developer 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), the Department will also demonstrate operation at a remote location to establish the existing condition of all elements to be impacted by the Work. The Developer shall document the condition of the site through field notes and photos as needed. The Developer shall provide written notification to the Department of any site deficiencies within twenty-four (24) hours of the inspection. The Department will assess deficiencies and provide a response to the Developer within forty-eight (48) hours of receipt of the Developer's report. The response shall include one of the following:

Department Repair/Replace – The Department will repair or replace deficient equipment prior to the start of the Work. A second inspection will be scheduled to document the existing condition of the Assets prior to the start of the Work.

Proceed per Plan – The Department will instruct the Developer 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 Developer shall complete the Work as required by the Agreement 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, the Department may instruct the Developer to relocate a camera as called for in the plans even if the camera is inoperative at the time of inspection. The Developer shall relocate the camera noting that it was inoperative prior to start and maintaining its current condition.

Request for Change – The Department shall request a change to the plans to address the deficient conditions. This may include requesting the Developer 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 Agreement, accounting for any impacts to schedule and scope.

4. Second Notification: 10 Days Prior to Work Start

The Developer 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 Developer shall provide the revised form with this notification. The Developer 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 Developer shall provide only a written reaffirmation of the original notification.

The Department will approve or reject the updated form within forty-eight (48) hours of its receipt and provide a written response per the requirements of the first notification.

5. Confirming Notification: 24 Hours Prior to Work Start

The Developer shall provide written confirmation of the planned Work a minimum of twenty-four (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.)

6. Final Notification: 15 Minutes Prior to Work Start

The Developer shall provide final notification fifteen (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 will identify these Assets on the notification form. The Developer shall provide this final notification to Department staff as identified by the Department in the notification process.

7. Work: Start of Work

The Developer shall carry out the Work in accordance with the Agreement and approved notification form. The Developer should provide daily updates to the Department on the progress of the Work or as required on the notification form. The Developer shall notify the Department of any events or issues that arise during the course of the Work that may impact the scheduled completion of the Work. The Developer shall provide a plan for recovery of schedule as needed.

8. Notification of Completion: Completion of Work

The Developer shall notify the Department immediately upon completing the Work. The Department will verify the operation of the Asset as needed to ensure the basic scope of the Work is completed. The Department will notify the Developer immediately of any impact to normal operation of the Asset following completion of the Work.

9. Return of Maintenance: 48 Hours After Completion of Work

The Developer and the Department shall conduct a return of maintenance inspection within forty-eight (48) hours of completion of the Work. The Department will 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 will be provided no less than forty-eight (48) hours following the final inspection.

3.16 Maintenance During Construction

3.16.1 General

- A. The Developer shall prosecute the Work so as to avoid obstructions to traffic to the greatest extent practicable. The Developer shall provide for the safety and convenience of the general public and residents along the roadway and the protection of persons and property.
- B. The Developer shall keep the portions of the road being used by the public free from irregularities and obstructions that could present a hazard or annoyance to traffic.
- C. The Department will maintain all roadways and structures used by public, pedestrian and vehicular traffic at its expense, until such time as the paved surface and roadside appurtenances in the active construction work area are significantly impacted by the Developer's construction activities. (Significant impacts include pavement marking eradication, traffic lane shifts, surface paving, placement of temporary traffic barrier service, or similar activities). The highway trucks hauling material on the paved surface are not considered significant impacts. Once the Developer significantly impacts the active construction work area, the Developer shall be responsible for that active construction work area until Project Completion. The Developer shall be responsible for all maintenance in significant impacted active construction work areas including repairs to the roadway surfaces (fixing holes in the hard surface, patching the potholes and providing smooth surface).
- D. The Developer shall be responsible for the maintenance of the significant impacted assets in accordance with standard VDOT maintenance requirements. Significant impacted assets for which the owning authority is other than the Department shall be maintained by the Developer until such time as they are no longer impacted by construction and accepted back by the owning authority.
- E. The existing continuous count stations on the eastbound and westbound ramps to the Welcome Center at approximate mile marker 48 shall remain in place and fully operational. In the event a continuous count station is damaged or needs to be relocated as a result of the Developer's operation, the Developer shall

coordinate such repair or relocation work with the Department's contractor responsible for state-wide maintenance of continuous count stations. The Developer shall reimburse the Department for its costs to repair or relocate the continuous count station(s).

F. ITS Devices

1. The Developer shall maintain as operational all existing Department ITS devices in the general purpose lanes and HOV Lanes during construction unless otherwise approved by the Department. These existing Department ATMS devices include, but are not limited to: closed-circuit television (CCTV) cameras; dynamic message signs (DMS); vehicle detection systems (VDS); the reversible gate system; weather stations; Connected Vehicle Roadside Units (RSUs); and associated cabinets and infrastructure.
2. The Developer shall submit for approval a transition plan for the Lane Control Signals (LCS) and Shoulder Lane Monitoring System (SLMS) clearly identifying when they will be removed based on the phasing of construction. The Developer shall maintain as operational the existing LCS and SLMS per the approved transition plan.
3. Existing Department ITS devices 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 Developer shall be responsible for relocating and replacing existing ITS devices.
4. Once the existing ITS devices are impacted, the Developer shall be responsible for maintaining those devices until their final acceptance.
5. The Developer 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 Developer 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 Developer accordingly. The cost of repair work performed, plus 25% for supervisory and administrative personnel, will be deducted from monies due to the Developer for the Project.
6. The Department will operate and the Developer shall maintain existing ITS devices or temporarily replace with portable unit to provide similar functionality and coverage for the duration of construction as approved by the Department.

- 6.1 Portable CCTV shall provide uninterrupted view of the roadway with overlapping coverage.
 - 6.2 Portable DMS placement and spacing shall provide adequate coverage to convey messages to motorists.
 - 6.3 Both portable CCTV and DMS shall be integrated into the Department operation center for similar functionality and coverage.
- G. Where the Developer's MOT Plan requires traffic to operate on surfaces other than final surface or final alignment, the Developer shall be responsible for maintenance of these roadways, including repair of any damage caused by its operations or use by public traffic.
 - H. The existing drainage system will be maintained by the Department until the Developer starts impacting the drainage system, at which time all drainage assets within the impacted drainage system will become the Developer's responsibility.
 - I. The Department will maintain all existing lighting within the Project until the Developer begins impacting these assets, at which time impacted lighting will become the Developer's responsibility. At no time shall the lights within the Project be put out of service, unless otherwise approved by the Department.
 - J. 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.
 - K. The Developer's maintenance of the active construction work area shall be to the level of quality condition existing in the relevant active construction work area at the time Developer takes control of the active construction work area.
 - L. The Developer 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.
 - M. The Developer shall be responsible for performing construction maintenance during detours, suspension of work situations, flagging operations, grading operations, patching operations, and on all haul routes.
 - N. The Department will operate the gates and maintain assets necessary to operate HOV gates at Stringfellow Road and Monument Drive until such time as they are no longer required.

3.17 As-Built Documents

3.17.1 General

- A. As a condition to Project Completion, the Developer shall provide to the Department, as-built plans of the Project in accordance with the standards and specifications set forth in Attachment 1.5, which shall consist of two hard-copy sets, one electronic file of each plan in *.pdf format, one electronic file of each plan, and one electronic file in MicroStation *.dgn format of the final construction plans. The as-built plans shall be prepared, signed and sealed by a Professional Engineer, or a Land Surveyor as applicable, licensed in Virginia and submitted to the Department with the final application for payment. These plans will 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 be in the same format as the construction plans.
- B. As-built *.dgn drawing files shall be incorporated into the Maintenance Management Information System (MMIS) and linked with geospatial information to provide precise detail about each infrastructure element.

3.17.2 Tolling and Traffic Management System (TTMS)

- A. 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 camera, Dynamic Message Sign (DMS), Vehicle Detection Systems (VDS), pole and ground mounted cabinets, roadway lighting and electrical service panel.
- B. Provide fiber optic network splicing diagrams and splicing tables 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.
- C. Provide splicing tables with details for all existing Department cabinets that have had splicing altered. Splicing table details shall include specific fiber numbers.
- D. Provide a complete set of as-built plans showing all bores (successful and failed) on completing the Work. Ensure that the plans are dimensionally correct copies of the Construction Documentation and include roadway plan and profile, cross-section, boring location and subsurface conditions. The plans must show appropriate elevations referenced to a permanent Department feature (mast arm foundation, manhole inlet cover, head wall, etc.). Plans must be same scale in black ink on white paper, of the same size and weight as the

Construction Documentation. Specific as-built plan content requirements include but may not be limited to the following:

1. The Contract plan view shows the center line location of each facility installed, or installed and placed out of service, to an accuracy of 1 inch at the ends and other points physically observed in accordance with the bore path report.
 2. Provide either a profile sheet for each bore path, or a cross-section of the roadway at a station, or a roadway centerline profile. Show the ground or pavement surface and crown elevation of each facility installed, or installed and placed out of service, to an accuracy of within 1 inch at the ends and other exposed locations. On profile sheets for bore paths crossing the roadway, show stationing of the crossing on the Construction Documentation. On the profile sheets for the bore paths paralleling the roadway, show the Construction Documentation stationing. If the profile sheet for the bore path is not made on a copy of one of the Contract profile or cross-section sheets, use a 10 to 1 vertical exaggeration.
 3. If, during boring, an obstruction is encountered which prevents completion of the installation in accordance with the design location and specification, and the product is left in place and taken out of service, show the failed bore path along with the final bore path on the plans. Note the failed bore path as "Failed Bore Path - Taken Out of Service". Also show the name of the utility owner, location and length of the drill head and any drill stems not removed from the bore path.
 4. Show the top elevation, diameter and material type of all utilities encountered and physically observed during the subsoil investigation. For all other obstructions encountered during a subsoil investigation or the installation, show the type of material, horizontal and vertical location, top and lowest elevation observed, and note if the obstruction continues below the lowest point observed.
 5. Include bore notes on each plan stating the final bore path diameter, product diameter, drilling fluid composition, composition of any other materials used to fill the annular void between the bore path and the product, or facility placed out of service. Note if the product is a casing as well as the size and type of carrier pipes placed within the casing as part of the Agreement.
- E. The as-built drawings and documents shall be certified by the Developer's engineer of record to reflect the actual condition of Project at the end of the Work period and organized and indexed to facilitate easy retrieval of information.

- F. The as-built plans shall show field verified cabinet numbers, service panel numbers and roadway lighting pole electrical identification numbers.

3.17.3 Drainage

- A. Upon completion of the installation of any major drainage structure, the Developer shall prepare a final as-built survey of the major drainage structure and related upstream and downstream appurtenances and provide such survey to the Department. The as-built survey shall include the horizontal location and vertical elevations of the constructed major drainage structure in sufficient detail to confirm pre-construction hydraulic performance. A post construction as-built Hydrologic and Hydraulic Analysis (H&HA) and report shall be developed based on the as-built survey and submitted to the Department for review and acceptance. The post construction H&HA shall demonstrate that the anticipated post construction hydraulic performance of the major drainage structure matches or betters that of the pre-construction H&HA. If the post construction analysis shows an impact greater than the pre-construction H&HA or exceeds the construction tolerances established with the pre-construction H&HA, then the Developer shall be responsible for mitigating the adverse impacts of the post construction condition at no additional cost to the Department.
- B. The Developer 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 as-built plans.
- C. The as-built survey shall include the following information:
 - 1. Discharge structures – structure identification number, type, locations, dimensions and elevations of all weirs, bleeders, orifices, gates, pumps, pipes, and oil and grease skimmers;
 - 2. Side bank and underdrain filters, or exfiltration trenches – locations, dimensions, and elevations, including clean-outs, pipes, connections to control structures and points of discharge to receiving waters;
 - 3. Storage areas for treatment and attenuation – storage area identification number, dimensions, elevations, contours or cross-sections of all, sufficient to determine stage-storage relationships of the storage area and the permanent pool depth and volume below the control elevation for normally wet systems;
 - 4. System grading – dimensions, elevations, contours, final grades or cross-sections to determine contributing drainage areas, flow directions and conveyance of runoff to the system discharge point(s);

5. Conveyance – dimensions, elevations, contours, final grades or cross-sections of systems used to divert off-site runoff around or through the new system;
 6. Water levels – existing water elevation(s) and the date determined;
 7. Benchmark(s) – location and description (minimum of one per major water control structure); and
 8. Wetland mitigation or restoration areas (if any) – Show the plan view of all areas, depicting a spatial distribution of plantings conducted by zone (if plantings are required by permit), with a list showing all species planted in each zone, numbers of each species, sizes, date(s) planted and identification of source of material; also provide the dimensions, elevations, contours and representative cross-sections depicting the construction.
- D. If Developer prefers to abandon in place any existing drainage structures or culverts, approval must first be obtained from the Department. All abandoned drainage structures and culverts shall be depicted on the as-built plans.
- E. The Developer shall provide as-built survey of all stormwater management facilities. The as-built survey shall show the actual finished ground contours, outlet structure dimensions and elevations, etc. as they exist at the completion of the project. These drawings shall be signed and sealed by a Licensed Professional Engineer or Land Surveyor registered in the Commonwealth of Virginia. If the post construction survey shows a deviation from Department accepted design storage and discharge values, then the Developer shall be responsible for mitigating the adverse impacts of the post construction condition at no additional cost to the Department.
- F. The Developer shall provide certification from an independent source that the proposed proprietary BMP facilities were constructed in accordance with applicable and current industry standards, and the manufacturer's specifications.

3.17.4 Utilities

The Developer shall accurately show the final location of all utilities on the as-built plans for the Project. The Developer will ensure the utility companies submit as-built plans upon completion of their relocation or adjustments. The Department will issue an as-built permit to the utility companies after receipt of permit application and as-built plans.

3.18 Survey

The Developer is advised that the field survey and utility data provided is not represented to be up to date and complete for purposes of design and construction of the Project. The Developer's scope of work shall include verifying and updating all surveying and utility designation that is necessary to design and construct the Project in accordance with the VDOT 2014 Survey Manual. Due to the length of the overall corridor and various construction projects underway at the time of the 2014-2015 survey, not all areas throughout the corridor were surveyed at the time of the most recent survey. The most recent effort began May 2014 and was completed May 2015 using the VDOT 2014 Survey Manual and Microstation SS3. For those areas under construction at the time of the most recent survey, previously existing survey data has been provided. This data has been moved to the I66 project coordinates and provided in separate files along with the completion date of the work.

The survey was conducted using conventional survey and fixed wing mapping methods; air flight and data was collected within the tolerances defined in the VDOT Survey Manual and the Virginia Map Accuracy Standards. Low level, high accuracy flight was not performed as part of the survey effort for this project.

All surveying work throughout the term of the Agreement shall be performed by the Developer in accordance with the Department's Survey Manual.

3.18.1 Scope and Area

The fixed wing mapping and subsequent digital terrain model (DTM) surface includes the I-66 Corridor from Catharpin Road on the western end to approximately 1200' west of the Barbour Road overpass on the eastern end. The mapping extends +/-700' to both sides of the central corridor. Additional mapping extends approximately 7000 linear feet in each direction at each interchange.

The ground survey, property line, and ROW data limits is along the central corridor and 3,500 LF in either direction at the interchanges. All property lines and easements, as well as the ground truthing effort, have been performed for the central corridor and the area within 50 feet of the ROW and are included in the survey drawings.

The ground survey effort includes, but is not limited to the following:

- A. Notification of property owners – all notifications are currently expired and will need to be resubmitted prior to entering properties.*
- B. Vertical control (Based on NAVD88 Geoid 2012A)
- C. Horizontal control (Based on NAD83-2011) - project scale factor 1.000060206
Survey baseline, one each, east and west bound lanes of I-66 and a single baseline at all interchanges

- D. Field data verified and updated
- E. Planimetric locations
- F. Property data and ROW
- G. Location of easements uncovered during deed research
- H. Utilities - Location of above ground utilities.
- I. Digital Terrain Model – complete in areas of fixed wing mapping, except for those areas shown as obscured in the CAD files.
- J. Modified bridge surveys – to include clearances only
- K. Sound barrier wall locations and heights
- L. Wetland locations
- M. Clearances for all overhead lines, signs, and bridges across the I-66 Corridor

*The Virginia Code 33.2-1011 requires that Notice of Intent letter “shall be sent to the owner at the address recorded in the tax records, not less than fifteen (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/dates such entry is proposed to be made and the purpose of such entry” not to exceed ninety (90) days. 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 Department for forwarding to the District Survey Manager as soon as they become available for the Department approval.

The preliminary field survey and utility data provided in the RFP Information Package contain the general depiction of existing conditions which the Developer is obligated to verify and finalize through survey before completing final design of the Project. The special accuracy of the preliminary survey is at a map scale of 1:600 and 1-foot contours, is .5 feet, with a vertical Class 1 limiting error of 0.0833. The Developer shall be responsible for obtaining any survey data, including all right-of-entry and land use permits, locating and designating underground utilities, DTM, utility test holes, and obtaining other related data necessary for the design, ROW acquisition, limited access revisions, and construction of the Project. Additionally, the Developer 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 ROW and complete the final design. Any survey changes shall be verified and certified, and submitted in final documentation.

The Developer shall preserve all survey control monuments established by the Department and will notify the Department as soon as it is known that a monument

is in a position that will interfere with new construction or with Developer activities. The Developer will be responsible for resetting or relocating 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 Department.

The Developer shall protect all construction benchmarks within the construction limits. Construction benchmarks shall be located not farther than 500 feet apart for the total length of the project. Construction benchmarks that are disturbed during construction operations shall be reestablished by the Developer.

The Developer shall also be responsible for the production of VDOT ROW sheets for any land transactions, which would include, but not be limited to the following: Fee Acquisitions, the establishment of temporary or permanent project related easements, total takes, and any land exchanges that may be negotiated by any entity.

All ROW sheets shall conform to the current standards set forth by the VDOT Survey Manual and the VDOT Survey CADD Standards. All sheets shall be signed and sealed by a Virginia Licensed Land Surveyor and at a minimum comply with the State's APELSCIDLA Board Rules and Regulations.

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

Immediately after or within seven (7) days from receiving the Department's request notice, provided the information exists, the Developer shall make available to the Department hard copy and electronic files of all survey data, for existing and new conditions and infrastructure.

3.18.2 Survey Control Data

- A. Digital Terrain Model and Construction Cross-Sections: Compatible to the Department's current DTM format.
- B. Borrow Pits: All borrow pit DTM's or cross-sections, originals and finals.
- C. Horizontal and Vertical Control for Bridges: Certified plats, field notes, coordinates, and computations shall be furnished by the Developer prior to the Developer beginning work on these structures.
- D. Pipes, Culverts, Ditches and Related Appurtenances: Existing, newly installed control and as-built survey data for existing and new pipes, culverts and ditches which at a minimum include horizontal and vertical controls, type, size,

materials and inlet and outlet control, catch basins and manhole and other related infrastructure.

- E. Road ROW: Existing, newly constructed and installed control and as-built survey data for right-of-way cross section showing roads, lane configuration, shoulders, access and egress ramps and connections, embankments, utilities, drainage and all infrastructure within the road ROW, and for areas where connecting roads and infrastructure are impacted by the Work. The survey interval shall not be farther than 100-foot intervals. The data prepared by the Developer shall include coordinates, type, size, material and references.

The Project ROW shall be staked by the Developer in areas where Work shall occur between the general purpose lanes and the limits of the Project ROW if no limited access fence is present prior to the start of the Work. ROW stakes shall be placed at a minimum of 100-foot intervals on each side of the roadway or as directed by the Department and the stakes shall be marked with both the station and offset back to centerline. All final boundary stakeouts shall be performed by the Developer.

Additional surveying work and supplemental layout work shall be performed by the Developer as needed to successfully complete the work. All drawings, field notes, and computations from such survey work performed by the Developer shall be submitted to the Department as defined and approved in the Developer's Project Development Plans.

3.19 Security

3.19.1 General Requirements

- A. Subject to the requirements of the Agreement, the Developer shall adhere to the Department policy on critical infrastructure information and sensitive security information (CII/SSI) to the extent such information is directly related to the Developer's performance of its obligations in accordance with Attachment 3.19. The Developer shall ensure that relevant CII/SSI is protected and not disclosed to unauthorized persons.
- B. The Developer shall review with the Department any information that should be designated as CII/SSI as specific design details become available. Any additional requirements for security reviews or other inspections will be agreed to with the Department.
- C. The Developer shall be required to undergo criminal history records checks in accordance with Attachment 3.19.

3.19.2 Developer's Responsibility During Suspension of Construction

In case of suspension of construction Work, the Developer shall take such precautions as may be necessary to prevent damage to the Work, provide for erosion control and drainage, and erect any temporary structures, signs, or other facilities necessary or appropriate for the protection of the Work and the public. During the suspension of the Work, the Developer shall properly and continuously maintain in acceptable growing condition all living material in newly established plantings, seeding, and sod furnished under the Agreement and shall take adequate precautions to protect new tree growth and other important vegetation against damage. Work pursuant to the Landscaping section of the Agreement is covered and limited by the landscaping allowance.

3.20 Railroad Design

3.20.1 The Developer shall incorporate the appropriate railroad design requirements for railroad crossings and any roadway that may parallel or encroach on Norfolk-Southern ("NS") or other railroad property interest, such as a frontage road. Designs impacting on NS or other railway property interest shall meet or exceed the applicable requirements or criteria, as provided by the railroads. Railroad requirements on Department-led projects are included in the Standard Documents in Attachment 1.5.

3.20.2 The Developer shall coordinate directly with the railroads impacted by the Project. The Developer shall coordinate with the Norfolk-Southern Chief Engineer – Bridges and Structures during the Work period of the Project. The Chief Engineer – Bridges and Structures can be reached at the following address:

Norfolk Southern Corporation
1200 Peachtree Street
Atlanta, GA 30309

3.21 Transit Facility Design

3.21.1 The Developer shall incorporate the appropriate transit facility design requirements for any WMATA transit facilities impacted or relocated by the Project. Designs impacting WMATA facilities or property interests shall meet or exceed the applicable requirements or criteria, as provided by WMATA. Requirements as provided by WMATA on Department-led projects are included in the Standard Documents in Attachment 1.5.

3.21.2 The Developer shall coordinate directly with WMATA on transit facilities impacted by the Project. The Developer shall coordinate with WMATA during the Work period of the Project. The WMATA Primary Project Liaison can be reached at the following address:

WMATA Office of Joint Development and Adjacent Construction
3500 Pennsy Drive, Bldg. C, Room C106
Landover, MD 20785

3.21.3 The Developer shall relocate or reconstruct any WMATA transit facilities required to construct the Project Work including impacts caused by Maintenance of Traffic on I-66 or other roadways impacted by the Project Work. Developer must keep uninterrupted access to WMATA traction power and tie breaker station facilities for maintenance and operations unless approved by WMATA. The Developer shall allow WMATA reasonable and timely access for normal and emergency maintenance and operations of the track guideway, stations, barrier wall, systems, and support facilities.

3.21.4 The Department will provide the Developer a traction power simulation study submitted to WMATA based on WMATA's criteria and standards that includes the characteristics and locations of the relocated Orange line transit facilities including traction power substations and tie breaker stations. If the Developer changes the characteristics and location of these facilities contained in the simulation and designs already coordinated with WMATA, the Developer will be required to submit an update of the traction power simulation for WMATA approval. Based on preliminary evaluation by the Department, it is anticipated that these relocated facilities could include, but not be limited to, the following:

A. Traction Power Substation (TPSS) – at Dunn Loring Station (Gallows Road)

1. It is anticipated that the Developer shall be required to relocate the traction power substations (TPSS) at the WMATA Dunn Loring Station (known to WMATA as the Gallows Road TPSS) due to the roadway widening included in the Project Work, unless an alternative design proposed by the Developer can avoid impacting this TPSS including obtaining WMATA approval for any vertical clearance requirements for Project Work.
2. The Department has identified a site for the relocation of the TPSS as included in the simulation, and has advanced the design to coordinate with WMATA on seeking their approvals but it shall be the Developer's responsibility to confirm this location meets all design requirements of WMATA.
3. The new location of this TPSS shall be constructed, approved and accepted by WMATA for operations prior to the existing TPSS and TBS being taken off-line (de-energized) and then demolished to allow for the roadway widening. It should be assumed that none of the current equipment at the existing TPSS or TBS can be reused in the new facility.
4. The layout of the traction power substation shall meet all WMATA criteria, including but not limited to accessibility for maintenance vehicles that require WB-62 Access.

5. The Department will coordinate with and obtain Fairfax County Special Exception/2232 land-use approvals for TPSS and TBS facilities as required.
6. If modular (pre-fabricated) TPSS units are approved for use from WMATA, they will require enclosures and screening to meet Fairfax County Land-Use Permit (Special Exception/2232) requirements.
7. The Developer shall prepare final design site plans based on concept plans provided by the Department for the TPSS site that will require civil, site and utility work including but not limited to access road paving, drainage, stormwater management, utilities, fencing and landscaping.
8. The Developer is required to obtain all required permits and regulatory approvals for the relocated TPSS facilities that are not provided by the Department.

B. Traction Power Substations (TPSS) – at Cedar Lane

1. It is currently anticipated that no impacts to the TPSS building off Cedar Lane will require relocation of the TPSS due to Project Work.
2. The Developer may be required to revise the entrance and associated site work from Cedar Lane to facilitate permanent access for uninterrupted WMATA operations and maintenance access.

C. Tie-Breaker Stations (TBS) – at Yeonas Drive and Prosperity Avenue

1. It is anticipated that the roadway widening work may impact the tie breaker stations (TBS) at Yeonas Drive and Prosperity Avenue. Based on the preliminary simulation, the Developer shall be required to replace these impacted facilities. The Developer shall be required to follow all WMATA requirements for de-energizing and taking these TBSs off-line prior to demolition.

D. TPSS upgrades at Fisher Avenue, Barbour Road, and Vienna

1. Based on the results of the simulation, additional equipment upgrades including transformer units may be required at the Fisher Avenue, Barbour Road, and Vienna TPSS to meet current WMATA criteria. It is anticipated these upgrades will not be required if the Developer does not impact the TPSS at Dunn Loring Station (Gallows Road). Developer must keep uninterrupted access to TPSS for WMATA maintenance and operations including vehicle access unless otherwise approved by WMATA.

3.21.5 DVP Power Conduits

- A. The Developer shall be required to coordinate with Dominion Virginia Power (DVP) on the relocation of the existing 34.5 kV traction power feeder lines and construction of new 34.5 kV feeder lines and meter locations that will provide power to the relocated traction power substations.
- B. It is anticipated that both DVP and WMATA will review and approve the feeder line design and manhole size and locations for operations and maintenance.
- C. The Developer shall coordinate and determine any impacts required by the traction power feeder construction on sidewalks, drainage, lighting, retaining walls, other utilities, etc.
- D. Any additional upgrades requested by Dominion to service commercial customers other than WMATA shall be viewed as a betterment and will not be funded by the Department.

3.21.6 Other Utilities

- A. The Developer shall be responsible for the relocation of other utilities required by the Project Work, including but not limited to the following:
 - Communication – Fiber Optic lines
 - Power, Gas and water to the station and pedestrian bridges
 - Other utilities that provide service to WMATA, including the communication ductbank that is integrated into the roadside barriers in median
- B. Any utility service to WMATA shall not be suspended without the approval of WMATA.

3.21.7 Tailtrack Impacts

- A. The Developer shall coordinate with and seek any required approvals for impacts to the tailtrack storage west of the Vienna Station. Any impacts to WMATA's tailtrack storage shall be minimized during peak storage periods (i.e. overnight period). Current work equipment vehicular access, including WB-50, shall be maintained.
- B. The Developer shall avoid work in the tailtrack storage area during the period of the Cherry Blossom Festival (March-April) and July 4 to allow WMATA full use of the entire tailtrack area for storage of extra rail cars to meet the ridership demand during this period.

3.21.8 Pedestrian Bridges - Dunn Loring Station and Vienna Station

Due to potential impacts of the roadway widening as part of the Project Work to the pedestrian bridges from the Dunn Loring Station (to the south) and Vienna Stations (to the north) over I-66, the Developer may be required to reconstruct the bridges to accommodate longer spans over I-66. The Developer may be required to provide temporary bridges to provide access from the Dunn Loring and Vienna station platforms while the permanent pedestrian bridges are being constructed. The Developer's design shall not preclude WMATA's future replacement of any additional pedestrian bridges in the vicinity of the Project.

3.21.9 Track Overpasses (Bridges)

A. The Project Work is anticipated to include new and reconstructed roadway bridges over WMATA operational tracks and transit facilities. These include but are not limited to the following roadway bridges:

- Capital Beltway Ramps
- Gallows Road
- Cedar Lane
- Nutley Street
- Vaden Drive

B. For each roadway bridge crossing over WMATA tracks or facilities, the Developer shall coordinate the design, construction and obtain all required approvals from WMATA. This should include the evaluation of the transit Clearance Envelope for construction over the WMATA operating track, as well as any maintenance of traffic for roadway or transit facilities.

3.21.10 Parking Garages - Dunn Loring Station and Vienna Station

The Developer shall conduct the Project Work to avoid or minimize any potential impacts to the Vienna and Dunn Loring parking garages and surface bus and parking facilities. Work that impacts the entrances to these garages shall be limited to times the garages are not open during revenue hours unless approved by WMATA.

3.21.11 Roadway Access to Metro Stations

A. The Developer shall conduct the Work to avoid or minimize any potential impacts to the following roads that provide access to the Vienna and Dunn Loring Stations:

- Prosperity Drive

- Saintsbury Drive
- Virginia Center Blvd.
- Vaden Drive at Nutley Street
- Gallows Road

The Developer shall install way-finding signage inside the garage and at garage exits directing motorists to the appropriate exit and destination street, in order to mitigate the restriction of Vaden Drive garage access to right-in/right-out only.

- B. The Developer shall develop and submit for review and approval from the Department and coordinate with WMATA maintenance of traffic (MOT) plans showing how access on these roadways can be maintained, specifically during peak commuter periods.

3.21.12 Signs and Active Traffic Management (ATM) Systems

The Developer shall also be responsible for any impacts to and coordination and relocation or new facilities (if required) of the following facilities:

- Metro station guide and wayfinding signs
- ATM infrastructure related to WMATA
- Sign structure piers

3.22 Park-and-Ride Facilities

3.22.1 The Developer shall provide Park-and-Ride (P&R) facilities that provide commuter parking spaces and accommodation for bus transit, kiss-and-ride, carpooling, vanpooling, local shuttles, and private buses pursuant to the Table 3.22 and the Agreement. The Developer shall incorporate intersections and other access in its design and construction. The P&R facilities design shall take into consideration 2040 expansion needs and parking space requirements per Table 3.22.

3.22.2 Design of P&R facilities shall be in accordance with the most-recently published AASHTO *Guide for Park-and-Ride Facilities*, Department of Justice *ADA Standards for Accessible Design*, and other standards and specifications as set forth in Attachment 1.5. All roadway and parking lot pavement designs shall be in accordance with the provided minimum pavement design set forth in Attachment 3.7.

3.22.3 The P&R facilities shall be located according to the following:

- A. The P&R facilities shown on the RFP Conceptual Plans are included in the RFP document and are located to meet travel demand in the corridor, have near direct

access to the I-66 Express Lanes, and are included in the environmental document.

- B. Facilities shall provide the number of spaces as shown in Table 3.22 to meet the transit service, carpool, and vanpool demand for 2025.
- C. The Developer shall have the responsibility for locating P&R facilities to meet transit service and carpool and vanpool demand at locations specified in the Conceptual Plan or at alternative locations that meet all of the following criteria:
 - 1. The Project P&R facilities shall be adjacent to I-66.
 - 2. The Project P&R facilities shall meet the travel shed P&R facility demand and transit service demand (e.g., bus bays) as articulated in Table 3.22.
 - 3. Direct access is provided from the Project P&R facilities to the Express Lanes in the same manner as demonstrated in the RFP Conceptual Plans.
 - 4. Project P&R facilities locations, if altered from the RFP Conceptual Plans, are subject to approval by the Department and the Virginia Department of Rail and Public Transport (DRPT).
- D. In the case that the location of the P&R facility is not one of the RFP Conceptual Plans locations, the Developer shall be responsible for any additional analysis of new locations including but not limited to environmental and traffic assessments.

3.22.4 The P&R facilities shall, at a minimum, include the following:

- A. Bus bays and bus loop pavement areas, as well as carpool and vanpool pick-up and drop-off areas, constructed with concrete pavement in accordance with the standards and specification set forth in Attachment 1.5;
- B. Interconnected, but separate accommodations for bus facilities and circulation, kiss-and-ride facilities and circulation, parking areas and circulation, carpooling and vanpooling circulation, and general vehicular, pedestrian, and bicycle circulation;
- C. Two points of vehicular entry and egress to the arterial network, at least one of which will provide full access to all turning movements in and out of the site with the appropriate traffic control devices;
- D. Parking lots with internal walkways, lighting, circulation, and circulation roadways;
- E. Crosswalks connecting parking to waiting area shelter with transit stop(s);

- F. Sidewalks connecting crosswalks, accessible parking, covered bicycle parking, kiss-and-ride, and transit and carpool and vanpool waiting areas;
- G. Sidewalks (and shared use path facilities, as noted below) connecting the P&R facilities (at the P&R facility property line) to adjacent land uses and pedestrian facilities where they exist within 500 feet from edge of P&R facility property line;
- H. Shared use paths within P&R facilities and connecting to adjacent (at the P&R facility property line) land uses and bicycle facilities where they exist within 500 feet from edge of P&R facility property line or to adjacent road limits, as approved by the Department;
- I. Traffic control devices at access points (intersections and driveways) as warranted in accordance with latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) and applicable VDOT standards;
- J. On-site and off-site vehicle and pedestrian signage (including external facility and internal routing and wayfinding, transit route and service information and signage, and regulatory and information signage pertaining to facility operations) in accordance with the latest edition of the MUTCD, the Department standards, and local ordinances according to Attachment 1.5;
- K. Pavement markings consistent with the latest edition of the MUTCD and the Department standards according to Attachment 1.5;
- L. Lighting (vehicular and pedestrian areas) throughout the P&R facilities (including parking, bicycle racks, kiss-and-ride, and transit and carpool and vanpool waiting and pick-up and drop-off areas);
- M. Covered bicycle racks to accommodate a minimum of 75 bicycles in each P&R facility near the waiting area shelters with appropriate lighting and signage;
- N. Trash receptacles throughout each facility (at least one receptacle per waiting area shelter);
- O. Bus stop and carpool and vanpool waiting area signage (and associated poles or other mounting accommodations);
- P. Static transit information display cases of sufficient size to accommodate large route maps and other transit service information for passengers (display cases to be installed throughout P&R facility bus areas, one per bus waiting area);
- Q. Real-time parking availability information and support infrastructure including but not limited to connections to the Department's fiber optic facilities, Vehicle Detection Systems (VDS) to count entering and exiting vehicles, and CCTV camera surveillance covering all parking spaces;

- R. Real-time transit schedule and bus arrival information and support infrastructure including but not limited to connections to the Department's fiber optic facilities and on-site real-time display stanchions at each bus bay;
 - S. Bus bays, bus circulation roadways (exclusive from other P&R facility circulation), passenger waiting areas (with platforms 6 inches above vehicle pavement), walkways, security cameras, lighting, benches, transit service information, and covered passenger waiting area located in an area connected directly to, but separate from, general parking areas; covered passenger waiting areas shall be designed to comfortably accommodate a minimum of 60 standing passengers per bus bay; kiss-and-ride area for passenger and carpool and vanpool pick-up and drop-off with adequate waiting space (platforms a minimum of 12 feet wide for the entire length of the pick-up area) for passengers (platforms) and vehicles, benches, and pedestrian connections to other parts of the P&R facility;
 - T. Designated carpool and vanpool pick-up and drop-off area with covered passenger waiting area (platform 6 inches above vehicle pavement) that can comfortably accommodate a minimum of 60 people standing (this structure is to be separate from transit facility waiting area structures), walkways, security cameras, lighting, benches, signage, pedestrian connections to other parts of the P&R facility, vehicular pick-up and drop-off accommodations for six vehicles per each P&R facility; and
 - U. Landscaping in accordance with local regulations and adhering to the principles of Crime Prevention through Environmental Design (CPTED) as outlined by the National Crime Prevention Institute.
 - V. The power supply for P&R facilities shall be separately metered from Express Lanes facilities.
- 3.22.5** All P&R facilities shall be designed in accordance with local jurisdictions' regulations for elements including but not limited to setbacks, landscaping, erosion and sediment control and grading. All P&R facilities shall be coordinated with local jurisdictions.
- 3.22.6** The Developer shall provide at least two P&R facility conceptual layouts (inclusive of all facility elements) at each location for consideration and review by the Department prior to commencing final design. P&R facility concepts previously developed by the Department are for conveying the design intent of each facility and are provided to the Developer for information only.
- 3.22.7** Architectural features shall be complementary to the surrounding land use(s) and adjacent and nearby facilities in coordination with local Governmental Authorities and are subject to approval by the Department.

3.22.8 Based on final design approved by the Department, the Developer shall construct and make available, for public use, the number of P&R facility parking spaces by facility as indicated in Table 3.22 (opening year requirement). As used in this Section, “make available” shall mean that the parking spaces are in a condition to be used for their intended purpose. Parking spaces shall be paved, marked, connected with internal vehicular systems, served with adequate stormwater management facilities, connected by pedestrian facilities, and lighted according to project requirements. The Developer shall construct the P&R facilities according to the following:

- A. The Developer shall grade each P&R facility constructed for the Project, by or before the opening year, to accommodate the future 2040 requirement for number of spaces as shown in Table 3.22;
- B. The number of bus bays by facility, as indicated in Table 3.22, shall be constructed by or before opening year to meet the future (2040) demand; and
- C. Kiss-and-ride spaces shall also be made available by the Project Completion Date. The minimum number of kiss-and-ride spaces shall be 2% of the total parking spaces identified to meet the 2040 demand shown in Table 3.22.

3.22.9 At the Fairfax Center (Monument Drive) location in Fairfax County, P&R facility spaces required to meet opening year requirements are assumed to be provided by reconfiguring existing parking facilities, including but not limited to the Fairfax County Government Center and the parking lot to the northwest of the Fairfax Corner development. On-site amenities described above shall be provided at these locations in a manner to be approved by the Department, Virginia Department of Rail and Public Transportation (DRPT), and Fairfax County.

Table 3.22: Park-and-Ride Facility, Bus Bay, and Parking Space Requirements

P&R Facility Preferred Alternative Location	Minimum Bus Bays Required	Minimum Commuter Parking Spaces Required (Opening Year)¹	Future Commuter Parking Spaces Required (2040)¹	Minimum Acres Required²
Opening Year Requirement				
Gainesville (University Boulevard)	4	1,920	2,370	47.3
Gainesville (Cushing Road/Route 234)	No Work Required	No Work Required	1,090 ³	N/A
Manassas (Balls Ford Road)	3	1,300	1,620	32.4
Fairfax Center (Monument Drive) ⁴	2	630 ⁴	820	Use existing surface lots ⁴

Note: Direct access is assumed to be constructed at the Cushing Road Park-and-Ride prior to 2040.

1. P&R spaces required do not include spaces required for kiss-and-ride area, as described in 3.22.8 C
2. Acres required indicative of acquiring enough right-of-way by opening year to meet 2040 P&R facility demand (at University Boulevard and Balls Ford Road) and is intended to accommodate pick-up and drop-off areas; all waiting areas, kiss-and-ride, circulating roadways, sidewalks, access roadways, sidewalks, and multiuse paths; and stormwater management facilities.
3. Represents total space (including existing space) needed to meet future demand; no work required.
4. For opening year requirements, spaces at Fairfax Center (Monument Drive) are assumed to be provided by reconfiguring the existing commuter parking lot at the Fairfax County Government Center in coordination with and subject to the approval of the Department, DRPT, and Fairfax County.

3.23 Transit Services and Travel Demand Management (TDM) Strategies

3.23.1 Transform 66 Outside the Beltway is a multimodal project that includes the accommodation of existing Metrorail and bus transit services (provided by various agencies) and introduction of new bus transit service and new travel demand management (TDM) strategies which will be planned and procured by the DRPT and by local transit and TDM agencies. The current I-66 Transit/TDM Preferred Alternative (Transit/TDM Technical Report), relies on the access locations to and from the Express Lanes, as well as the locations of the P&R facilities, as proposed in the NEPA Tier 2 documents.

3.23.2 Any changes in the Express Lanes access locations or P&R facility locations will necessitate a reexamination of the Transit/TDM Preferred Alternative. Proposed transit service and TDM strategies, as stated in the Tier 2 NEPA documents, shall not be negatively impacted by proposed changes in the Express Lanes access or P&R locations by the Developer.

3.23.3 Should access locations to and from the Express Lanes or locations of P&R facilities deviate from those cited in the NEPA Tier 2 documents, the Developer

shall examine impacts on proposed transit service and TDM strategies and shall propose appropriate modifications to the Transit/TDM Preferred Alternative to maintain the proposed transit routes and frequency of bus service. The Developer shall perform this examination in close coordination with the Department, DRPT, and local transit agencies.

- 3.23.4** No less than 12 months prior to Service Commencement, the Developer shall dedicate a liaison to work with DRPT to increase the traveling public's awareness of the benefits of using the P&R Facilities.

4 Operations, Maintenance, and Tolling For the Express Lanes

4.1 General Requirements

- 4.1.1** The Developer shall operate and maintain the Project assets including the ETTM System and ETTM Facilities for the duration of the Operations Period in a manner consistent with the Agreement.
- 4.1.2** The Developer shall implement an effective operations management framework which should include but not be limited to: traffic management, monitoring, control and enforcement, facility management and administration, and tolling administration, operations, enforcement, and collection.
- 4.1.3** The Developer shall provide an Operations and Maintenance (O&M) facility located within the Northern Virginia District. The O&M facility shall be LEED V 2.2 Silver Certified as defined by the US Green Building Council's rating system for new construction.
- 4.1.4** The Developer shall implement an effective Maintenance Management System which should be capable of recording inventories, failures, repairs, maintenance activities, inspections performed, and defects.
- 4.1.5** The Developer shall meet all operations, maintenance, and tolling Performance Requirements in accordance with the Agreement.
- 4.1.6** The Developer shall record defects in accordance with the Performance Requirements within its system as described in this section.

4.2 Inspection Requirements

4.2.1 General Requirements

- A. The Developer shall engage or employ or cause the O&M Contractor to engage or employ trained and competent personnel to plan and implement a program of inspections of the Project. This program shall achieve the following:
 - 1. Provide for the continuing safety of the Project for users;
 - 2. Prioritize defects requiring immediate and urgent attention because they are likely to create a hazard or serious inconvenience to users;
 - 3. Identify other defects to be included for repair within the Developer's annually recurring maintenance and repair program (e.g., Life Cycle Maintenance Plan);
 - 4. Responsiveness to reports or complaints received from stakeholders;

5. Take account of incidents and emergencies affecting the Express Lanes;
 6. Monitor the effects of extreme weather conditions; and
 7. Collate data to monitor performance of the Express Lanes and to establish priorities for future maintenance operations.
- B. The Developer shall require personnel performing inspections of road pavements to be certified as inspectors in accordance with standards and specifications set forth in Attachment 1.5.
- C. All shared and Department bridges and structures shall be inspected by the Department. For structures of the type listed in Section 3.14.1 of the Technical Requirements that are maintained by the Developer it shall be the responsibility of the Developer to perform all safety inspections for these structures required by the Structure and Bridge Division's Instructional and Informational Memorandum S&B-IIM-27 Bridge Safety Inspections, S&B-IIM-82 Traffic Structures, or then-current applicable standards.
- D. Defects that are subject to the Performance Requirements and the Timeliness Requirements require prompt attention.

4.2.2 Inspection Frequency

- A. The Developer shall establish inspection procedures and carry out inspections so that:
1. All defects that present a hazard are identified, documented, and repaired such that the hazard is mitigated within the time periods set out in the Performance Requirements;
 2. All defects that present a hazard are identified, documented and remedied within the time periods set out in the Performance Requirements; and
 3. All other defects are identified, documented, and repaired within the time periods set out in the Performance Requirements.
- B. The periods stated in Attachment 4.5 shall be deemed to be periods from the time the relevant defect was first identified by or brought to the attention of the Developer.
- C. The Developer shall investigate reports and complaints on the condition of the Express Lanes received from all sources. The Developer shall record these as O&M records, together with details of all relevant inspections and actions taken in respect to defects, including temporary protective measures and repairs. These reports shall be made available to the Department upon request.

4.2.3 Inspection Standards

In performing inspections to identify defects, the Developer shall at a minimum conform to the inspection standards set forth in Attachment 1.5.

4.2.4 Safety Inspections

The record of a safety inspection shall include details of the weather conditions, road surface condition, and any unusual features related to the method of inspection.

4.2.5 General Inspections

The Developer shall perform general inspections in accordance with the O&M Plan so that the repairs of all defects are included in planned programs of Work.

O&M Records in respect of general inspections shall include details of the manner of inspection (e.g. center lane closure or shoulder), the weather conditions and any other unusual features of the inspection.

4.2.6 MOT During Operation for Routine Maintenance, Major Rehabilitation Maintenance Work, Maintenance Project and Construction Projects

The Developer shall follow Department Policy for Lane Closures in the Northern Virginia District as updated at the time of actual lane closure.

4.3 Maintenance Requirements

4.3.1 General Obligations

- A. The Developer shall maintain the Express Lanes and shall take all necessary action to perform the following:
1. Maintain the Express Lanes pursuant to the Agreement;
 2. Minimize traffic delay to drivers;
 3. Respond to all incidents and defects in accordance with the Agreement and mitigate adverse effects;
 4. Provide users with adequate information and forewarning of any events on, or any matters affecting, the smooth operation of the Express Lanes as will enable them to minimize any associated adverse consequences;
 5. Protect the safety of users, workers, or other persons on the Express Lanes or other portions of the Project ROW used for Express Lanes operations;

6. Protect the environment by minimizing the risk of adverse effects on the environment and on the amenities enjoyed by the owners and occupiers of land near the Project ROW;
 7. Minimize the risk of damage or disturbance to or destruction of third-party property;
 8. Enable the Department and others with statutory duties or functions in relation to the Express Lanes to perform those duties and functions through agreed protocols; and
 9. Perform inspections in accordance with the Agreement.
- B. The Developer shall maintain the bridges identified in accordance with the Agreement and Attachment 4.3.
 - C. The Department will maintain the general purpose lanes (including structures and overpasses that carry only general purpose traffic and related infrastructure) as outlined in Attachment 4.3.
 - D. The Developer shall maintain Express Lanes slip ramps that carry traffic to or from the Express Lanes to the general purpose lanes and flyover ramps that carry traffic to or from the Express Lanes.
 - E. The Developer shall maintain Express Lanes (including structures and overpasses that carry only Express traffic and related infrastructure) as outlined in Attachment 4.3.
 - F. In accordance with the Agreement, the Department and Developer shall maintain Department Shared Assets as outlined in Attachment 4.3.
 - G. Subject to Department approval, the Developer shall be responsible for mowing operations within the median areas between the Express Lanes and general purpose lanes of I-66.
 - H. All E-ZPass logos and purple pavement markings shall be maintained by the Developer. The Developer shall visually inspect the logos and pavement markings for deficiencies, including illegibility or other imperfections, and document these inspections to the Department through photos accompanying an inspection report every six (6) months.
 - I. The Developer shall implement a wet accident reduction program to identify locations with known high occurrences of wet accidents and implement appropriate mitigation measures, such as increase friction on affected road surfaces.

4.3.2 O&M Data Management

- A. Prior to Project Completion, the Developer shall implement a computer-based Maintenance Management System (MMS), capable of recording inventories, failures, repairs, maintenance activities, inspections performance, communications, and notifications of incidents and defects. The Developer shall enter all of the assets into the MMS with Asset identifications (IDs) as determined by the Developer and consistent with those descriptions and units of measure used in the Roadway Network System and PONTIS (or equivalent system) for structures and bridges, which are used by the Department. The inventory shall, where appropriate, include separate records for subcomponents of each Asset. All information shall be recorded in a consistent manner and shall be searchable by individual attributes.
- B. The MMS shall include relevant condition information with respect to each Asset, which should include but not be limited to location, equipment nomenclature, serial number, name, date of installation, technician, type of failure, date and time of failure, date and time of response to the site and date and time returned to service, preventive maintenance work, schedule work, work repair code, failure and repair history, Asset Residual Life, and statistical data on mean time between failure (MTBF) and Mean Time to Repair (MTTR). Residual Life means the calculated duration that any Asset of the Project, subject to the type of routine maintenance of the Asset which is normally included as an annually recurring cost in highway maintenance and repair budgets, will continue to comply with any applicable Performance Requirement or standard after the end of the Term, before Major Maintenance is required, determined through the application of Residual Life methodology and residual life inspections. The MMS shall be able to report work by work repair code, asset (or subcomponent), location and unit of measure.
- C. Defects and responses to defects shall be recorded on the MMS within two days of them coming to the attention of the Developer or action being taken. All other recording requirements shall be recorded on the MMS within 7 days of completion or occurrence of the relevant activity.
- D. The Developer shall ensure that the MMS is capable of generating the information required to demonstrate achievement of the Performance Requirements for each Asset.
- E. In accordance with the Agreement, the Developer shall provide the Department access to the MMS at all times for the purposes of auditing the accuracy of the Developer's O&M records. Such access shall require reasonable advance notice and access shall not be delayed or hindered, nor shall such access impact any operational or maintenance activities.

- F. The MMS shall be kept updated and operational throughout the Operations Period.

4.4 Operations Requirements

4.4.1 General Obligations

- A. The Developer shall be responsible for the following, among other things:
 - 1. Employment and training of competent personnel to carry out all operations aspects of the O&M Plan;
 - 2. Coordination of activities of third parties with interests within the Express Lanes;
 - 3. Monitoring the condition and operational performance of the Express Lanes;
 - 4. Incident response, management and reporting;
 - 5. Traffic operations restrictions, including periods of lane closure restrictions;
 - 6. Standard operating and communication procedures for Emergency preparation, response, and recovery;
 - 7. Planning and coordination with all relevant Governmental Authorities, including emergency services;
 - 8. Operate the Electronic Toll and Traffic Management (ETTM) System;
 - 9. Liaison with MPSTOC;
 - 10. Analysis of vehicular accident patterns to identify safety issues;
 - 11. Investigation of reports or complaints received from all sources;
 - 12. Toll enforcement and coordination with law enforcement for the Express Lanes;
 - 13. Snow and ice removal services on the Express Lanes including the Mainline, shoulders, ramps, and buffer area between the Express Lanes and the general purpose lanes.
- B. The Developer shall monitor and observe weather and weather forecasts and deploy resources to minimize delays and safety hazards due to severe weather events, including snow and ice events, in accordance with the Agreement and the O&M Plan.

- C. In emergency situations where the Department must take managerial control of the Express Lanes per the Agreement, Developer's staff will continue to operate the facility from the Express Operations Center under managerial control from the Department.

4.4.2 Data Collection

- A. A process of data collection shall be established that includes, but is not limited to: traffic data in each direction, traffic volume, lane occupancy, and speed data.
- B. The data collection process shall be continuous (not periodic). Notwithstanding the requirements to collect and provide data for the facility the parties recognize that from time-to-time, and in the normal course of business, data for specific locations may not be available due to technical issues, or other issues outside of the Developer's control. In such instances the Developer will endeavor to remedy the issue in accordance with normal business practices.
- C. The Developer shall store all data and make the data accessible to the Department in accordance with the Agreement.
- D. The Developer shall maintain a fully documented application programming interface (API) for traffic and incident data on the Express Lanes, which shall be available 99.0% of the time.
- E. There shall not be any restrictions on the Department regarding use of the data or on its distribution to third parties, such as the Regional Integrated Transportation Information System (RITIS) and other agencies such as the District of Columbia Department of Transportation (DDOT) and the Maryland State Highway Administration (MdSHA).

4.4.3 Data Compiling and Reporting

- A. The Developer shall archive all collected traffic data and make the data available for the generation of reports and for audits of data by any persons permitted by the Department for this purpose, in accordance with the Agreement.
- B. The Developer shall commence delivery of the report to the Department after the second full month following the Service Commencement Date. Thereafter, reporting shall occur on a calendar monthly basis.
- C. Data shall be compiled between the eastern and western termini of the Project, based on the Reporting Segments in accordance with the Agreement, or as amended by the Agreement.
- D. Data compilation will include Peak Periods traffic volumes and traffic speeds on Express Lanes at each Mainline VDS by lane and hour within the morning

and evening weekday time period over a consecutive 180 day period. The time range of the Peak Periods may be adjusted by the Department from time to time to reflect change in travel conditions in accordance with the Agreement.

- E. The report shall include, at a minimum:
1. Degradation section indicating Percent Degradation (as defined in these Technical Requirements) on the Mainline of the Express Lanes for each Reporting Segment for the period under review;
 2. Speed exception section showing Substandard Stations, days, and time periods where the Percent Degradation fell below the defined threshold; and
 3. Documentation of any periods that were impacted by incidents or activities outside of the control of the Developer where the Percent Degradation fell below the defined threshold.

4.4.4 Degradation Assessment

- A. For the purpose of determining degradation, volume and speed data that is useable and non-corrupt will be analyzed for each Express Lanes Mainline VDS.
- B. Each Station whose weighted average speed over the Peak Period falls below the defined minimum average operating speed for each of the Operating Speed Performance Standard (OSPS), as applicable, will be identified as Substandard Station for the applicable calculation.
- C. The speed degradation percentage will be calculated for morning Peak Period and evening Peak Period separately. The percentage of degradation for Peak Periods is given by the following formula applied to weekdays:

$$\text{Percent Degradation} = \frac{\sum 1^{180} \text{Substandard Stations} \times 100}{(\text{Stations} \times 180 \text{ Days})}$$

(a) The numerator equals the summation of all Substandard Stations within the consecutive 180 day period for weekdays only.

(b) The denominator equals the total number of Stations upon which the calculations is based multiplied by the number of weekdays within the consecutive 180 day period.

(c) For the avoidance of doubt, the degradation assessment will result in at least eight different values being calculated for each reporting cycle for the whole Express Lanes facility. Each value is based on the

Reporting Segments in accordance with the Agreement. This is made up of at least four different values (i.e., two AM EB, two PM WB) and at least four different values for OSPS (i.e., two AM EB, two PM WB).

4.4.5 Federal Degraded Facility

A. Degradation Standard

1. Per Title 23, United States Code (USC) Section 166. (d) (2), a degraded facility for the purpose of determining which classes of vehicles are permitted to use the HOV lanes, is defined below. The Developer shall comply with the provisions of any amendment or supplement to, or replacement or substitution of, the provisions governing "Degraded Facility" as defined by federal law:

(A) DEFINITION OF MINIMUM OPERATING SPEED.--In this paragraph, the term "minimum average operating speed" means

(i) 45 miles per hour, in the case of a HOV facility with a speed limit of 50 miles per hour or greater; and

(ii) not more than 10 miles per hour below the speed limit, in the case of a HOV facility with a speed limit of less than 50 miles per hour.

(B) STANDARD FOR DETERMINING DEGRADED FACILITY. – For purposes of paragraph (1), the operation of a HOV facility shall be considered to be degraded if vehicles operating on the facility are failing to maintain a minimum average operating speed 90 percent of the time over a consecutive 180-day period during morning or evening weekday peak hour periods (or both).

2. Per Title 23, United States Code (USC) Section 166. (d) (2), the facility is considered degraded when compliance is less than or equal to 90 percent, where:
 - The minimum average operating speed is less than 45 mph.
 - Compliance means: 100 Percent – Percent Degradation is greater than or equal to 90 percent
 - Percent Degradation will be calculated for weekday Peak Periods for the Mainline Express Lanes Reporting Segments.

4.4.6 Operating Speed Performance Standard

- A. The Developer shall meet or exceed the OSPS. The OSPS is in addition to the federal requirement that the Express Lanes are not a degraded facility.

- B. The Developer shall provide a minimum average operating speed of 55 mph on the Express Lanes.
- C. For purposes of determining whether or not the facility is degraded, data from time periods corresponding to the following events shall be excluded from the calculations:
 - 1. All periods identified in the Agreement, including periods of toll suspension; when the Department assumes control of the Express Lanes under the terms of the Agreement; data during incident conditions as described in the Agreement; and during Major Maintenance periods, when working to agreed programs.
 - 2. Police, military, STRAHNET, and other related activities.
 - 3. Backups due to conditions outside of the control of the Developer.
 - 4. Force Majeure Events.
- D. The facility is considered degraded by the OSPS when Compliance is less than or equal to 90 percent, where:
 - 1. The minimum average operating speed is more than 10 mph below the posted speed limit.
 - 2. Compliance means: $100 \text{ percent} - \text{Percent Degradation}$ is greater than or equal to 90 percent
 - 3. Percent Degradation will be calculated for weekday Peak Periods for the Mainline Express Lanes Reporting Segments
- E. The impact of the Developer's failure to meet the OSPS in any calendar month shall be governed by the Agreement.
- F. The continued application of the OSPS will be in accordance with the Agreement.

4.4.7 Incident Management

- A. The Developer shall provide equipment and personnel to support incident and emergency management operations on the Express Lanes in accordance with the Operations and Maintenance Plan. The Developer shall take necessary action using appropriate resources to handle any and all traffic control needs to ensure the safety of the incident scene and traveling public and to minimize the potential for pollution of watercourses or groundwater.

- B. Detailed requirements for incident management equipment and personnel, and their performance, shall be developed as part of the Operations and Maintenance Plan.
- C. In the event of an Incident, the Developer shall provide traffic management, real time traffic information and video feeds to the Department, as appropriate, depending on the nature of the Incident in accordance with the Interface Control Document and protocols developed.
- D. The Developer shall coordinate and confer with the Department’s NRO TOCs and other first responder community stakeholders in developing the incident management plans and when carrying out incident management operations.
- E. Where structural damage to an Express Lanes structure, which poses an imminent risk to the traveling public, is suspected, the extent of damage and condition of the structure shall be evaluated, documented, and reported by a bridge and structural engineer with the following qualifications:
 - 1. Is a Professional Engineer, licensed in the Commonwealth of Virginia;
 - 2. Meets the qualifications to be a “Team Leader” in accordance with the requirements of Article 650.309 of the National Bridge Inspection Standards, 23 CFR 650.3; and
 - 3. Has extensive experience with in-service bridge inspection, emergency bridge inspection, maintenance, repair and rehabilitation of bridges, structural evaluations, and load ratings.
- F. The Developer shall not reopen any area of the Express Lanes which has been closed, until all appropriate safety and traffic management measures have been completed and any issues related to Hazardous Substances have been mitigated to a safe level.
- G. The Developer shall ensure that procedures are in place for public and agency notifications, incident management, ensuring the safety of motorists, handling of hazardous waste, and coordination with the Department, police and other emergency personnel with respect to emergency incidents and occurrences.
- H. The Developer shall identify a management-level, on-call “duty officer” consistent with the Department’s duty-officer policy.

4.4.8 Traffic Management – Detection of Incidents

- A. In locations as outlined in the Agreement, an appropriate system shall be deployed that is capable of automatic video-based or equivalent, detection of incidents within 5 minutes of occurrence, 95% of the time within areas monitored under normal conditions (“AID system”).

- B. Incident information (including the character and severity of the incident) shall be entered into VA Traffic, the Department's incident information system, within five (5) minutes. Such information shall include:
1. The location of the incident (identified by mile marker and nearest interchange)
 2. The lane(s) impacted
 3. The severity of the incident
 4. The number of vehicles involved
 5. The number of disabled vehicles
 6. Whether there are any injuries or fatalities
 7. Results of injury or fatality investigations
 8. Whether hazardous materials are involved
 9. The estimated time for response to the incident
 10. The estimated duration of the incident
 11. Updates regarding the status of the incident

4.4.9 Driver Information (Express Lanes)

- A. The Developer shall use the TMS, including the DMS, to provide road users with relevant information in accordance with the Operations and Maintenance Plan, including the use of DMS to impart information on behalf of the Virginia Department of Emergency Management (VDEM).
- B. Traffic management messages that contribute to the safety of motorists and road workers shall be applied within five (5) minutes of the detection and classification of an incident or the identification of deteriorated road conditions, in accordance with the Operations and Maintenance Plan.
- C. The ISA for T&DI for DMS (each sign) shall be at least 99.9% excluding the effects of any condition beyond the reasonable control of the Developer. The ISA for traffic management DMS shall be at least 99.9% excluding the effects of any condition beyond the reasonable control of the Developer.

4.4.10 Emergency Evacuation

- A. The Project is designated as an emergency evacuation route for the Washington Metropolitan Area. The Developer shall control access to the Project

throughout the corridor under the direction of the Department should an evacuation be directed pursuant to a Governor declared emergency. These requirements will apply during all Governor-declared emergencies.

- B. The Developer shall develop and implement an evacuation plan in coordination and consistent with plans, programs, and requirements of the Commonwealth of Virginia, to include the Department, the Virginia Evacuation Coordination Team for Operational Response (VECTOR), Virginia State Police (VSP), and the VDEM. The plan shall include a plan for lane reversal, and standard operating procedures that identify all required tasks to be performed, the party that will perform these tasks, and how these tasks will be accomplished. The plan shall include the performance and documentation of one annual drill for evacuation and emergency procedures, where such drill is deemed necessary and undertaken as part of the review of evacuation plans associated with a Governor declared emergency, on similar highways in the State.
- C. The Developer shall provide for the effective implementation of the evacuation plan and the lane reversal plan, in coordination with the Department in a Governor-declared emergency. This implementation shall include:
 - 1. Facilitation of large scale traffic movements during evacuations and re-entry;
 - 2. Implementation and provision of traffic information and advisories using various traveler information media and systems;
 - 3. Providing manpower, equipment, and materials as needed to control traffic during evacuation and lane reversals;
 - 4. Monitoring traffic conditions and providing timely incident response and management during evacuations;
 - 5. Providing local access from reversed lanes as applicable; and
 - 6. Providing procedures for effective termination of lane reversal at the conclusion of the declared emergency.
- D. The Developer shall participate in the development and update of future state, regional, and local emergency evacuation plans with other stakeholders including the Department, VSP, VDEM, and other agencies and organizations. The Developer shall send a representative to participate throughout the Operations Period in any annual state-wide coordination meetings for evacuation and emergency services held during the year.

4.4.11 Waste Disposal and Use of Hazardous Substances

The Developer shall be responsible for the management, treatment, handling, storage, monitoring, remediation, removal, transport, and disposal of any Hazardous Substances that are discovered on, in, under or emanating from the Project ROW during the Term, in each case in accordance with applicable regulatory requirements, the Agreement and the Environmental Management Plan in Attachment 1.3.

4.4.12 Snow and Ice Removal

- A. The Developer shall be responsible for snow and ice removal services on the Express Lanes, including the Mainline, shoulders, ramps, and buffer area between the Express Lanes and the general purpose lanes, in accordance with the Agreement and the O&M Plan in Attachment 1.3.
- B. The Developer's snow and ice removal services shall be performed at a comparable level of service to what the Department provides on the general purpose lanes.
- C. The Developer's O&M Plan shall include a Severe Weather Plan that is subject to Department approval.
- D. The Severe Weather Plan shall address the following:
 - 1. Coordination with the Department in advance of and during severe weather events;
 - 2. Minimum levels of equipment for each of the 5 mobilization levels shown in Exhibit 2 of Attachment 1.8;
 - 3. Liquid anti-icing operations or snow and ice removal operations at the same levels as the Department for each of the mobilization levels shown in Exhibit 2 of Attachment 1.8;
 - 4. Procedures to limit snow and ice accumulation in the buffer area;
 - 5. Access to the Express Lanes for the Department or its contractors to place excess snow in appropriate and available areas of the median;
- E. VDOT-approved Automatic Vehicle Location (AVL) equipment with Global Positioning System (GPS) shall be installed in each vehicle involved in snow and ice removal operations. AVL information shall be shared with the Department during severe weather events throughout the Operations Period for the Department to conduct well-coordinated snow and ice removal operations. The Department may share similar ALV information with the Developer for their use in conducting similar operations for the Express Lanes.

- F. The Developer's snow and ice removal operations shall not in any way hinder the Department's removal of snow and ice from the general purpose lanes.

4.5 Performance Requirements

- 4.5.1** Within the Technical Requirements, reference to the Performance Requirements means the Asset Condition Performance Requirements, Ordinary Maintenance Performance Requirements, and the latest approved version of the Northern Virginia TAMS Performance Requirements.
- 4.5.2** The baseline service levels for routine maintenance will be equal to or greater than that of other similar highways in the Commonwealth of Virginia. The Baseline Level of Service requirements are set out in Attachment 4.5.
- 4.5.3** The Asset Condition Performance Requirements are set out in Table 4.5a in Attachment 4.5.
- 4.5.4** The Ordinary Maintenance Performance Requirements shall be in accordance with Table 4.5b in Attachment 4.5 and the most current Northern Virginia TAMS Performance Requirements in effect during the maintenance period.
- 4.5.5** The Developer shall use the program of inspections supplemented by the Maintenance Management System to demonstrate compliance with the Performance Requirements at all times and shall report for each Asset, its performance in meeting all applicable criteria and Timeliness Requirements in the monthly O&M report in a format to be agreed between the Developer and the Department prior to Project Completion. Performance also shall be summarized in an end-of-year report, as outlined in the Agreement.
- 4.5.6** The Developer shall set forth as part of the O&M Plan, reviewed and updated as necessary, a document describing the means by which it intends to demonstrate achievement of the Performance Requirements.
- 4.5.7** Where the Developer fails to meet the Performance Requirements, Non-Compliance Points may be assessed pursuant to the Agreement.
- 4.5.8** The Developer shall update the Ordinary Maintenance Performance Requirements ninety (90) days before Project Completion to reflect current industry standards and changes, consistent with the Northern Virginia TAMS criteria in place on similar highways in Northern Virginia. The Department will approve the updated tables thirty (30) days before the Project Completion Date and then thirty (30) days before every subsequent update.
- 4.5.9** Updates shall include improvements to inspection and measurement methods, measurement records, performance minimums, tolerances, and criteria as are

necessary to comply with the current Northern Virginia TAMS criteria in place on similar highways in Northern Virginia.

- 4.5.10** The Project shall be subject to the Department's Maintenance Rating Program (MRP), or subsequent updated or replacement program. The Developer shall use the MRP results provided semi-annually by others to verify performance of each Asset against the criteria set out in the Performance Requirements. The Developer shall include in the end of year report outlined in the Agreement, a summary of the results of annual assessments in a format to be agreed between the Developer and the Department.

4.6 Maintenance and Handback Requirements

4.6.1 Maintenance and Life Cycle Maintenance Plan

- A. The Developer shall perform maintenance in accordance with Attachment 4.6 Maintenance Responsibility Matrix so that all assets are capable of meeting the appropriate Performance Requirements when subject to ordinary maintenance and so that any defects which affect the long-term performance of the Project are repaired in good time to prevent undue deterioration of any Asset.
- B. In order to properly identify and plan for Major Maintenance for pavement throughout the Term, the Agreement describes the requirements for a Life Cycle Maintenance Plan to include a description of all Major Maintenance for pavement to be undertaken. The major maintenance, repair, reconstruction, rehabilitation, restoration, renewal and replacement activities listed in the Life Cycle Maintenance Plan shall meet the Performance Requirements set forth in the Technical Requirements and other standards and requirements set forth in the Agreement.
- C. The Life Cycle Maintenance Plan updates during the last five (5) years of the Term will be subject to additional oversight by the Department in accordance with the Agreement.

4.6.2 Transition Plan

- A. The purpose of the Transition Plan is to provide the Department with a clear understanding of the Developer's approach to the management, operations and maintenance of the facility so that the Department can ensure a smooth transition from Developer to the Department at the end of the Operations Period.
- B. The Transition Plan shall include a checklist of relevant activities in sufficient detail for a smooth transition from Developer operations to Department operations.

- C. The Transition Plan shall be delivered to the Department in draft form no less than 365 days before the end of the Operations Period. The Department will review the Transition Plan and request any changes within a period of thirty (30) days. The Developer shall submit the final Transition Plan to the Department no more than thirty (30) days after receiving the Department's comments.
- D. In the last one-hundred-eighty (180) days of the Operations Period the Developer shall meet with the Department at least monthly to share information on the management, operations and maintenance of the facility in a good faith effort to ensure smooth transition from Developer to Department. The Developer shall answer Department questions on any items included in the Transition Plan and any additional questions that may arise.

4.6.3 Handback Requirements

- A. At the completion of the Operations Period, the Developer will handback to the Department a functional system with all assets having a remaining life of 5 years or more, within its normal lifecycle. The functional system shall include all roadside and Developer back office elements (e.g., cameras, readers, IAG antennas, VDS, communications network, etc.) of the traffic management system and tolling system. The Developer will document annual inspections based on the Life Cycle Maintenance Plan, and also demonstrate through final inspections and analysis that the Handback Requirements are met. To the extent the Developer or the O&M Contractor have any operations or support services for the Project that are located outside the Commonwealth of Virginia, the Developer shall cause the such operations or support services to be integrated into the corresponding Department office or system or relocated to the Commonwealth of Virginia.
- B. The Developer shall mill and overlay general purpose lane pavement, including shoulders and ramps, so that it has a minimum remaining service life of 10 years at Handback.
- C. The Developer shall reconstruct the pavement on the Express Lanes, shoulders, and ramps, so that it has a minimum remaining service life of 30 years at Handback.
- D. The general condition rating for channels and channel protections (Item 61), and large culverts (Item 62) shall be at a level of 6 ("Satisfactory Condition") or better, as defined in the FHWA Recording and Coding Guide for Structure Inventory and Appraisal of the Nation's Bridges, prior to Handback.
- E. The Developer shall perform deck replacement, including bridge joints and bearings, on Express Lane structures and Department Shared Assets structures prior to Handback. The Developer shall recoat any component of the superstructure as required by the Department prior to Handback.

4.7 Tolling Requirements

4.7.1 General

- A. The Electronic Toll Collection (ETC) system shall be operated and maintained by the Developer to fulfill its obligations under the Agreement and in a manner such that ensures ETC Performance Requirements, as set out below, are met. Upon the Developer receiving notice of a problem with the dynamic tolling mechanism, the Developer shall submit to the Department, for its approval, a rectification plan.
- B. The ETC system shall be operated and maintained by the Developer to fulfill its obligations under the ETC Agreement.
- C. Reference Attachment 4.7 that identifies conceptual tolling zones and points consistent with the I-66 Operations Concept Technical Report and Tolling and Revenue Study.

4.7.2 ETC Performance Requirements

- A. Roadside equipment shall have an ISA of at least 99.9%. This shall exclude scheduled downtime and loss of power or any other condition beyond the Developer's control.
- B. The ETC system shall have an ISA of at least 99.9%, excluding scheduled downtime and loss of power.
- C. At least 99.8% of transponder records shall be correct; i.e., the data supplied are complete and relate correctly to the transponder detected for properly fitted and operating transponders, and excluding non-normal operation due to signal attenuation from a metallic wind screen or other similar condition beyond the control of the Developer.
- D. At least 99.5% of payment claim records shall be correct; i.e., the data supplied are complete and relate correctly to the payment due for the trip, the displayed prices, and the transponder to which it relates, excluding the effects of other conditions beyond the reasonable control of the Developer.
- E. Records of transponder transactions shall be transmitted to the Department according to the current interface specification, or as otherwise agreed between the Department and the Developer within five (5) business days unless written agreement has been obtained from the Department.
- F. Records of transactions for which the transponder was not valid or where a transponder was not read may be submitted for attempted posting (VToll) according to the VToll interface and business rules in effect at the time.

- G. Any transactions that include the read of a valid transponder at the time of the transaction that are not submitted within sixty (60) days may not be collected by the Developer.
- H. Tag status files are to be loaded and distributed through the system and used for each transaction to ensure images are recorded for the correct vehicles. This should be completed such that transactions with an entry date and time within one (1) hour of receipt from the Department, (in accordance with the ETC Agreement) shall be processed according to the status in that file 99% of the time, subject to receipt of a confirmed accurate tag status file from the Department, excluding the effects of other conditions beyond the reasonable control of the Developer.
- I. The tag number captured from a tag shall be recorded without error at least 99.99999% of the time (no more than one error in 10 million). In addition, no more than one such error in 100 million shall result in the wrong tag number becoming associated with the capture. This is subject to the transponder supplier performance requirements.
- J. In the event the Department receives two or more representations from customers in a calendar month claiming to have been charged a Express Lane toll from the same toll point while using the general purpose lanes, the Developer shall present to the Department a management plan to investigate system performance. The Department and Developer agree that the customer confidence in the tolling system is essential and that misreads from the general purpose lanes must be addressed as a matter of urgency.
- K. Accuracy for correctly assigning the transponder to the correct vehicle and therefore license plate, to be 99.5% for properly fitted and operating transponders, and excluding non-normal operation due to signal attenuation from a metallic wind screen or other similar condition beyond the control of the Developer.

4.7.3 Transactions

- A. The Department (in accordance with the Electronic Toll Collection Agreement) will supply tag status information, which should be loaded and distributed through the system and used for each transaction to ensure images are recorded for the correct vehicles. The Department reserves the right to reject duplicate transactions based upon accepted E-ZPass business rules.
- B. The Developer shall use commercially reasonable efforts to ensure that requests for payment are made only from accounts on the list of current active tags transmitted by the Department.
- C. Upon notification that the Developer has requested payment from an account that the Department has previously informed the Developer is invalid or no

longer in good standing, the Developer must reconcile or audit the data transmission within three (3) business days to identify all other instances that may have occurred.

- D. The Developer shall use commercially reasonable efforts to ensure that no duplicate transactions or incorrect toll amounts are transmitted to the customer service center.
- E. Statements, invoices, and notices for transactions not paid by transponder shall accurately display the registered vehicle owner (or other party legally responsible for the tolls) name and address as received from the appropriate legal party (e.g. DMV), the date, time, and location of individual trips with associated tolls and fees, totals for the customer 99.99% of the time. Such notices or invoices shall be issued within sixty (60) days of transaction unless held-up by customer look-up delays by third parties not under the control of the Developer and the Developer requested lookup data in a timely fashion (within ten (10) days of entry or correction of license plate data.) Transactions not issued within sixty (60) days by the Developer due to system or operational issues within the control of the Developer may not be collected by the Developer. For the avoidance of doubt, where a recipient of a toll violation notice or invoice has referred such notice or invoice to a different individual by means of a signed affidavit, the 60-day period contemplated above shall begin anew with respect to such newly identified individual.
- F. Complete trip records – The Developer shall ensure all contiguous tolling detection points in a single travel direction are incorporated into a single trip record 99.95% of the time.
- G. Upon notification from the transaction processing system of a duplicate transaction or an incorrect toll amount on a per transmission basis, the Developer must reconcile or audit the data transmission within three (3) business days to identify any and all other duplicate transactions or incorrect toll charges that may have occurred and shall transmit correction files or requests for toll corrections to the customer service center for action.
- H. Within 5 business days of identification of a duplicate transaction, the Developer shall transmit the information in accordance with the ETC Agreement.
- I. Following receipt of two or more complaints within thirty (30) days of transponder reads from vehicles traveling in the general purpose lanes emanating from a single toll point the Developer shall investigate the complaints. In the event that a cross-read occurred or reasonable doubt exists as to whether a cross-read occurred, the Developer shall, within fifteen (15) days of receipt of such second complaint, prepare correspondence that can be sent to all customers who have made such a complaint regarding the erroneous

general purpose lane reads. The Developer shall provide information to the public outlining the issue with reads from tags in the general purpose lanes within fifteen (15) days of the receipt of such second complaint.

- J. Within seven (7) days of receiving notice that an incorrect toll amount has been charged (and provided that customer information has been provided) and that the incorrect charge has been validated, the Developer shall provide the customer service center with correspondence to be sent to the customer informing the customer that his or her account will be credited.
- K. Within three (3) days of discovery or notice from the Department that an incorrect toll has been charged, the Developer shall submit a plan to the Department for approval to rectify the billing problem.
- L. The Developer shall provide a mitigation plan in the event that communications with toll signage is lost as related to the displayed toll rate and the corresponding rate assigned to the trip record.
- M. During instances where the posting of trip records is interrupted, resulting in a backlog of records, the Developer, at the Department's sole discretion, may be required to limit the posting rate of records and require First In, First Out (FIFO) sorting in order not to overwhelm customer account balances.
- N. Any trip requiring a rating adjustment after being sent to the CSC for account posting shall be adjusted using the automated corrections interface identified by the CSC and such adjustment shall be initiated within 48 hours of notification or discovery. Discretionary adjustments to trip pricing shall be initiated within seven (7) days.
- O. The Developer shall provide monthly reports to the CSC regarding toll transactions and revenue to include: ETC transaction and Revenue with HOV and non-revenue transaction breakout (transponder and license plate), violation transactions, and associated toll revenues.
- P. The Developer shall ensure that, at all times, dynamic message signs along the Express Lanes display accurate information about toll rates and other travel information. Upon notification of the display of an incorrect toll amount, the Developer shall reconcile or audit the data transmission within one (1) business day to identify any and all other customer accounts that may have been impacted by the incorrect signage (to be determined on a per transmission basis).
- Q. The Developer shall comply with standards applicable to the retention of and use of customer records pursuant to Law, including § 33.2-504 of the Code of Virginia.

4.7.4 Customer Service Requirements

- A. The Developer shall develop a customer outreach and education program relating to facility operations for the Department's review and approval six (6) months prior to the commencement of tolling operations.
- B. Where contact details of customers have been provided, the Developer shall respond to customer inquiries and complaints about the Express Lanes within three (3) business days.
- C. The Developer shall answer customer phone calls within 45 seconds 90% of the time a customer elects to speak with a live customer service representative. Reports indicating call response performance shall be made available to the Department on a monthly basis.
- D. The Developer shall implement a Customer Relations Management tool that minimally tracks customer interaction and resolutions by description, date, and time.
- E. The Developer shall perform annually a 3rd party customer service assessment review and certification. Results of the review shall be provided in a report to the Department along with any necessary plans to address identified deficiencies.
- F. The Developer shall be required to provide customer service call recordings for a period up to ninety (90) days (or such other time period as provided by applicable rules and regulations) upon Department request when approved by the affected customer.
- G. The Developer shall develop an application for all mobile phone operating systems that provides customer access to real time toll pricing and Missed-a-Toll feature.
- H. The Developer shall provide customer service enhancements during the five years following Service Commencement.

4.7.5 Violation Processes

- A. For a trip record associated with a transponder owned by the Commonwealth that is not accepted by the CSC due to insufficient account balances, the Developer shall attempt to re-process the trip record in accordance with Virginia statute or the current ETC agreement. Failure to process the trip record through the re-try process will result in one final attempt to process the trip record using the vehicle's license plate prior to proceeding to a violation remedy process.

- B. The Developer shall offer a Missed-a-Toll feature to allow customers to address outstanding toll obligations prior to proceeding to a violation remedy process.
- C. The Developer, if requested by the Department, shall provide audited support for the computation of administrative fees in addition to the actual toll amount.
- D. Any mailed notice that is returned to the Developer as a result of an incorrect address shall require a re-start of the respective process once the proper mailing address has been confirmed.
- E. The Developer shall maintain a record of all mailed notices initiated by the back office solution and delivered to the United States Postal Service.
- F. Any caching of address information related to a vehicle's license plate shall be refreshed every sixty (60) days.
- G. The Developer shall ensure that any incorrect information returned from a lookup database, including license plates that are systematically misidentified, can be flagged for manual handling to prevent continued incorrect notices being sent to customers.
- H. The Developer shall implement address correction software and Skip-Tracing technologies to facilitate the accurate transmission of invoices.

4.7.6 Roadside ETC Support and Maintenance

The Developer shall support and maintain all roadside ETC equipment and infrastructure installed related to Express Lanes operations.

4.7.7 Information Technology Support and Maintenance

The Developer shall carry out information technology service management in accordance with the Agreement, including generally accepted VDOT Northern Virginia District practice.

4.7.8 Anti-Virus Scanning and Protection and Hacking Protection

- A. The Developer shall maintain an updated anti-virus, hacking, and protection procedures to protect the ETTM System from viruses and other destructive devices, and to manage the impact of virus attacks including transmission to the NRO ATMS or other Department or third-party systems.
- B. The Developer shall immediately notify the Department of any viral outbreak or similar destructive outbreak upon identification.

4.7.9 Interfaces

The Developer shall continuously monitor all interfaces for the ETC system. The monitoring should include availability, throughput, performance, buffer usage, queue lengths, hardware status, system alarms and warnings, and any other diagnostic data provided by the Developer's implementation of the interfaces. Reports on monitoring statistics shall be available to the Department upon request within five (5) business days. Any delays in processing and transmitting transactions in excess of two (2) business days shall be communicated to the Department along with an action plan for addressing the delays.

4.7.10 System Back-up and Recovery

- A. The Developer shall provide data security for the ETTM System. Data security may include the following:
 - 1. Backup of all software and configuration following each release of, or change to, the system, including any disaster recovery site;
 - 2. Daily back-up of all new and changed data held on the tolling system;
 - 3. Provision of the means for the daily back-up to be maintained at a secure off-site location within 24 hours (or other agreed timeframe); and
 - 4. Storage of one (1) month of the data back-ups in a secure off-site location.
- B. Backups shall not affect the ETC system's ability to capture, store or process detection data.

4.7.11 System Failure

- A. The Developer shall notify the Department without delay on becoming aware of any event or the likely event of any system failure that results in a critical element of the ETTM System not functioning, or that results in or is likely to result in a catastrophic impact on the public, the Department, or a third party.
- B. The Department will notify the Developer without delay on becoming aware of any event or the likely event of any system failure that results in a critical element of the NRO ATMS or the Department's customer service center not functioning, or that results in or is likely to result in a catastrophic impact on the public, the Developer, or a third party.
- C. Where the relevant system failure affects or may affect a third party, the Department, or its agents, the Developer shall provide the Department with all necessary available assistance in resolving the relevant system failure by cooperating fully and expeditiously with the third party, the Department, or its agents, as appropriate.

- D. Where the relevant system failure was caused by the Department or its agents, the Department will provide the Developer with all necessary assistance co-operation in resolving the relevant system failure, by cooperating fully and expeditiously with the third party or Developer, as appropriate.

4.8 Reporting During Operations Period

The Developer shall report on the performance achieved against each of the Performance Requirements in each reporting period, in accordance with the Agreement.

4.8.1 The Developer shall prepare and provide to the Department monthly reports during the Operations Period (as more fully described below). All reports prepared by Developer shall include, at a minimum, those items shown below in a format approved by the Department and sufficient to allow the Department to meet its regulatory reporting responsibilities.

4.8.2 The Developer's monthly O&M report shall be reviewed and approved by the Department and may include the following:

- A. Planning and implementation of operations, including work plans for the future periods;
- B. Roadway operations;
- C. Incident response times;
- D. Routine maintenance activities;
- E. Customer service log, detailing complaints or requests, and their disposition;
- F. Managed lane average daily traffic volumes;
- G. Average daily ANPR transactions;
- H. Average daily E-ZPass transactions;
- I. Average daily HOV volumes;
- J. Average daily toll revenue
- K. O&M inspections;
- L. Long-term participation SWaM goal;
- M. A summary of issues related to Performance Points during the reporting period;
- N. Quality management activities; and

O. Performance timeliness.

4.8.3 The Developer's annual report shall include the following:

- A. Summary of quarterly issues and trends as required for the Department's reporting to FHWA;
- B. Annual budget(s), as required by the Agreement;
- C. A report of O&M Overhead of the O&M Contractor or its Affiliates; and
- D. ETTM data, traffic data, and other data generated from operation of the Project or any ETTM System.

4.8.4 The Developer Management Plan shall describe the proposed formats, means of distribution, and recipients of the reports.

4.8.5 The Developer shall maintain at all times, at its office, a minimum of one hard-copy complete set of all reports shown above for the previous six (6) months only. All reports shall be available to the Department for inspection and audit. Additional reports may be required as future needs dictate, and the reports listed above may be deleted (by mutual consent of the parties).

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 1.1

Acronym Table and Definitions

ACRONYM TABLE AND DEFINITIONS

ACRONYMS

Acronym	Definition
AACE	Association for the Advancement of Cost Engineering
AFC	Approved for Construction
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
CADD	Computer Aided Drafting and Design
CTA	Cement Treated Aggregate
DBE	Disadvantaged Business Enterprise
DE	Design Exception
DW	Design Waiver
EDMS	Electronic Database Management System
EPA	Environmental Protection Agency
FDC	Field Design Change
GP	General Purpose
ICD	Interface Control Document
ID	Asset Identification
LL	Live Load
LRFD	Load and Resistance Factor Design
MPSTOC	McConnell Public Safety and Transportation Operations Center
MRP	Maintenance Rating Program
MSE	Mechanically Stabilized Earth
MUA	Master Utility Agreement
NADR	Noise Abatement Design Report
NCR	Non-Conformance Report
NDC	Notice of Design Change
NRO	Northern Regional Operations
NTCIP	National Transportation Communications for ITS Protocol
O&M	Operations and Maintenance
OCR	Optical Character Recognition
OSPS	Operating Speed Performance Standard
PDM	Precedence Diagram Method
PE	Professional Engineer
PS&E	Plans, Specifications, and Estimate
SPI	Schedule Performance Index
SWaM	Small, Women- and Minority-owned Business Enterprise
T&DI	Toll and Driver Information
TAMS	Turnkey Asset Maintenance Services
TCP	Traffic Control Plan

Acronym	Definition
TOC	Traffic Operations Center
VDEM	Virginia Department of Emergency Management
VECTOR	Virginia Evacuation Coordination Team for Operational Response
WBS	Work Breakdown Structure
WMATA	Washington Metropolitan Area Transit Authority

DEFINITIONS

Capitalized terms used but not otherwise defined in this Exhibit have the respective meanings set forth in the Agreement. In addition, the following terms have the meanings specified below:

Design Waiver is defined as a document required when deviations from VDOT's design criteria occur. When design criteria meet or exceed AASHTO minimal design but fall short of VDOT's minimal design, a Design Waiver shall be required. Design Waivers will be applicable to all projects regardless of functional classification and funding and shall be documented and approved in accordance with the Design Waiver Request form LD-448. This Design Waiver Policy is applicable to VDOT owned and maintained roadways only.

Design Exception is defined as a document required when the minimum AASHTO design criteria cannot be met for any of the 14 controlling criteria as listed in VDOT IIM (IIM-LD-227.9). . In such a case, an exception shall be secured from the State Location and Design Engineer and FHWA (if applicable). Design Exceptions are applicable for all projects on the National Highway System (NHS).

Disaster Recovery Plan is as defined in Section 3 of the Technical Requirements.

Degradation Standard is as defined in Section 4 of the Technical Requirements.

Hold Point is defined in VDOT's Minimum Requirements for Quality Assurance & Quality Control on Design-Build & Public-Private Transportation Act Projects

In-service Availability means a percentage of time equivalent to (hours available) / (hours in service) x 100%; in service time excludes scheduled down time and loss of power outside Developer control.

Mainline is the primary roadway in which the traffic sensors for speed and other traffic data operate excluding auxiliary lanes, collector-distributor roads or ramps.

Monthly Progress Earning Schedule is as defined in Section 1 of the Technical Requirements.

Notification Center is as defined in Section 56.265.15 of the Code of Virginia.

Peak Period is the period from 5:30 a.m. – 9:30 a.m. or 3:00 p.m. – 7:00 p.m., Monday through Friday, excluding holidays.

Percent Degradation is defined in Section 4 of the Technical Requirements.

Potomac Formation [silts/clays] are silts/clays defined as such in the Geologic Map of Virginia published by the Virginia Division of Mineral Resources.

Project Roll Plan is a scaled signage plan or plans showing proposed, existing, or relocated DMS and static signs on the 66 Express Lanes and connecting roadways.

Quality Assurance Manager means the person reporting to the Quality Manager responsible for the independent process of determining conformance of work by examining the quality control data.

Reporting Segment is defined as two Mainline segments for both the eastbound and westbound directions, one segment commencing at the Mainline sensor station prior to each exit and ending at the lane drop at each ramp and the second segment commencing at the lane gain.

Residual Life means the calculated duration that any Asset of the Project, subject to the type of routine maintenance of the Asset which is normally included as an annually recurring cost in highway maintenance and repair budgets, will continue to comply with any applicable Performance Requirement or standard after the end of the Term, before Major Maintenance is required, determined through the application of Residual Life methodology and residual life inspections.

Rights of Entry is as defined in Section 33.2-1011 of the Code of Virginia.

Secondary Settlement is as defined in AASHTO LRFD Bridge Design Specifications Section 10.6.2.4.

Security Plan is as defined in Section 3.15 of the Technical Requirements.

Standard Documents means the standards, special provisions and specifications listed in Attachment 1.5 – Standards and Specifications of the Technical Requirements.

Station is one or more traffic monitoring sensors at a single location used to collect traffic volume, lane occupancy, and speed data on the Express Lanes.

Substandard Station is a Station whose weighted average speed over the a.m. or p.m. Peak Period falls below the minimum average operating speed defined for each degradation standard.

Technical Concept Plans are defined as the plans required for the Technical Proposal.

Timeliness Requirements are as defined in Attachment 4.5 of the Technical Requirements.

Toll Operations Center is defined in Section 3.15.8 of the Technical Requirements.

Traffic Operations Center is defined in Section 3.15.8 of the Technical Requirements.

Trail Blazer Roll Plan is a scaled signage plan or plans showing proposed, existing, or relocated static signs on highways, feeder roads, and other roadways notifying motorists of the access to the Express Lanes.

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 1.3

Project Development Plans

Project Development Plans

General

- A. The general requirements for Project Development Plans (PDPs) are noted in Section 1.3 of the Technical Requirements.
- B. The PDPs shall be consistent with ISO principles (ISO 9001:2015 Quality Management Systems- Requirements; ISO 9004:2009 Managing for the Sustained Success of an Organization - A Quality Management Approach; ISO 9000:2015 Quality Management Systems- Fundamentals and Vocabulary; ISO:19011:2011 Guidelines for Auditing Management Systems; ISO 14001:2015 Environmental Management Systems-Specifications with Guidance for Use).
- C. The PDPs shall comply with the requirements of the Agreement including the Technical Requirements, and shall ensure that when implemented, the Work covered by the Plans will comply with such requirements.

1.1 Developer Management Plan

- A. The purpose of the Developer Management Plan is to provide the Department with a clear view of Project management approach undertaken by the Developer for all aspects and tiers of the Project. It shall clearly identify responsibilities and procedures for each Project management activity and demonstrate a thorough understanding of the Agreement and Project requirements.
- B. The Developer Management Plan shall reference and consider all other PDPs and link their relevance to each other and to the management approach.
- C. The Developer Management Plan is an umbrella document that describes the Developer's managerial approach, strategy, and quality procedures to design, build, operate and maintain the Project and achieve all requirements of the Agreement. The Developer Management Plan shall include an organization chart outlining the basic structure of the Developer's Project organization including well defined roles for the design, construction, operations and maintenance; sub-organizations (such as consulting, subcontractors, suppliers) and a description of the roles; organizational chart with responsibilities, professional qualifications, and Work to be accomplished by each member of the management team and each sub-organization, including identified subcontractors and suppliers.
- D. The Developer Management Plan shall describe how all PDPs fit within the overall quality management system, responsibilities for developing and maintaining the plans and the schedule for implementation.
- E. The Developer Management Plan shall address the Developer's schedule and procedures for preparation of amendments and submission of amendments to any part of the PDP.
- F. The Developer Management Plan shall be linked to the Quality Management System Plan (QMSP).

1.2 Document Management Plan

- A. The Document Management Plan will define the document management approach for all Project documentation and will address:
 - 1) The document management system;
 - 2) Document management procedures;
 - 3) Requirements for records retention;
 - 4) Electronic and hardcopy data transmission, storage and sharing;
 - 5) A logical, auditable and Project-compatible tracking system of all Project correspondence and documents for all phases of the Project.
- B. The Document Management Plan shall clearly define document management applicable to all aspects of the Project-management structure, tracking, updates, originator/recipient, document approvals tracking, searchable database, links amongst various documents, hard-copy and electronic filing.
- C. The Document Management Plan shall be appropriately structured to consider roles and participation by the Department, the Developer, and third parties participating and having input regarding the Project.
- D. The Plan shall also provide for electronic data management and storage, and electronic access to project documents remotely, with the required electronic security procedures.
- E. The Document Management Plan shall be linked to the QMSP.

1.3 Quality Management System Plan

- A. The QMSP will define the quality management systems during the design, construction and operations and maintenance. The Developer shall or shall cause to be completed all quality assurance and quality control activities required to manage its own processes as well as those of its Contractors, and suppliers of any tier. The QMSP shall:
 - 1) Be fully compliant with the Department's *Minimum Requirements for Quality Assurance & Quality Control on Design-Build & Public-Private Transportation Act Projects – January 2012*;
 - 2) Be developed consistent with ISO 9001 principles and clearly demonstrate how it will lead to continuing improvement;
 - 3) Define the Quality Management System roles and auditing responsibilities and procedures (internal and external);
 - 4) Establish quality objectives that are measurable and quantifiable;
 - 5) Provide an organizational chart with roles, responsibilities and professional qualifications applicable to all stages of the project;
 - 6) Describe how the relevant requirements of the contract will be met;
 - 7) Require any Contractor, or supplier employed by the Developer for design, construction, maintenance or operation activities to develop, implement and maintain a quality management system compatible with the requirements of the Agreement;

- 8) Be able to provide reports on quality with a tracking system, which at a minimum, includes:
 - a) searchable data
 - b) summary of inspection and quality control activities
 - c) internal and external quality audits performed
 - d) non-conformances and their status, such as quality item description; date opened; date closed; status (open, closed, pending, follow-up required); disposition (repair, reject, rework); status; corrective actions
 - e) how the non-conformity has been accepted by the Department, if applicable
 - f) updates the QMSP
- 9) Provide a means and procedure for “escalating” quality concerns of the Department or the Developer;
- 10) Provide a linkage amongst relevant Project Development Plans and address all quality-related items in those plans;
- 11) Provide a document management system;
- 12) Be updated regularly and produce a track-able record and reports of quality control, assurance and audits;
- 13) Explain the corrective action process for workmanship related quality issues in order to minimize the recurrence of such errors and quality problems.

1.4 Design Quality Management Plan

- A. The Design Quality Management Plan (DQMP) shall provide the organization, relationship and procedures that define clear lines of responsibility and well defined approach for meeting Project requirements and innovation in design approach.
- B. The Design Quality Management Plan shall be linked to the QMSP.
- C. The Design Quality Management Plan shall define the design approach, flow charts and activities for the design of the Project and will address:
 - 1) The design organization, responsibilities and professional certification;
 - 2) A drawing tier indicating organization and hierarchy of the Developer’s drawings;
 - 3) The design basis (e.g. design criteria, design standards and specifications);
 - 4) Design validation, ensuring that the intended design meets its intended use;
 - 5) Stages where design reviews are conducted and design work is certified by appropriate design professionals, including Professional Engineers registered in the State;
 - 6) Work zone and worker safety review during design;
 - 7) Quality assurance and control (including subconsultants);
 - 8) The breakdown of the Project design into design packages;

- 9) The process the engineering consultants and subconsultants will use to design and seal each design package;
- 10) The system engineering process for the design of the systems components;
- 11) The proposed strategy for integrating the facilities and systems component into the design process; design deliverables;
- 12) Design control-design input reviews, output reviews and verifications (design checks and professional review and seals) to ensure requirements have been met;
- 13) Design changes;
- 14) Internal and external audits;
- 15) Document management;
- 16) Provide regularly updated quality records and a tracking record of all quality control, quality assurance and audit records and a log of items and how they have been addressed, such as conformance, non-conformance, corrective actions and preventative actions, and implementation of corrective and preventative actions;
- 17) The process by which the Developer's team and the Department will be involved in the design review process;
- 18) Reporting and documentation mechanism;
- 19) Linkage to other relevant PDPs and the QMSP;
- 20) Certification of QA/QC.

1.5 Construction Quality Management Plan

A. The Construction Quality Management Plan will define the construction approach and activities for the construction of the Project and will address:

- 1) The construction organization and responsibilities – including the contractors and subcontractors;
- 2) Roles and professional qualifications of persons responsible for various aspects of the project;
- 3) Outline of procedures and schedules;
- 4) Sequence of construction activities;
- 5) Project permitting and coordination with the Department and external agencies;
- 6) Safety during construction;
- 7) Site security and access;
- 8) Environmental management;
- 9) Quality as outlined in the QMSP, specific to the construction phase;
- 10) The breakdown of the Project construction into construction areas/segments;
- 11) The general construction sequence;
- 12) Site temporary facilities and storage areas;

- 13) Field equipment and materials management;
- 14) Coordination with other projects, stakeholders, and impact of permitting;
- 15) Compliance with the Agreement;
- 16) Reporting and documenting changes;
- 17) Industrial relation;
- 18) As-built documents;
- 19) Reporting and documentation mechanism;
- 20) The process for conducting all activities related to achieving Project Completion including the representative inspection and documentation verification steps of all parties;
- 21) Linkage to other relevant PDPs and the QMSP.

1.6 Environmental Management Plan

- A. The Developer shall develop and implement a thorough approach to environmental management. The Developer will procure a qualified environmental consultant to conduct/update the technical studies to support the NEPA documentation process, as well as other regulatory approval processes.
- B. The Environmental Management Plan shall include the procedure and the party responsible for obtaining the required Governmental Approvals, interface with Governmental Authorities, and identifying and controlling the permit conditions to assure environmental compliance.
- C. The Environmental Management Plan shall define the environmental activities required during the design and construction of the Project and shall address:
 - 1) Compliance (monitoring, control, follow-up and audits) with applicable environmental law, regulations, Executive Orders, etc.;
 - 2) Erosion and sediment control plans, including monitoring and approach to erosion and sediment control,
 - 3) Stormwater management plans;
 - 4) Stormwater pollution prevention plans;
 - 5) Commitments for environmental impact avoidance, minimalization, and mitigation measures of protected resources/properties;
 - 6) Identify environmental monitoring and recording methodology requirements;
 - 7) On-going monitoring and compliance records tracking system;
 - 8) Compatible with ISO 19011:2004 Guidelines for Quality and/or Environmental Management Systems Auditing; and ISO 14001:2004 Environmental Management Systems- Specifications with Guidance for Use; and
 - 9) Linkage to other relevant PDPs, including the QMSP.

D. The Developer shall or shall cause to be maintained and updated an Environmental Management Plan that shall include:

- 1) Procedures and a contingency plan (emergency response plan) for reporting, immediate actions, and Remedial Actions to be taken in the event of a potential environmental permit violation, dump, discharge, or spill of Hazardous Substances, including, as required by Law, the development and implementation of a Spill Prevention, Control and Countermeasures (SPCC) plan(s);
- 2) Plans for investigation, handling, monitoring, discharge, release, storage, removal, remediation transportation, tracking, reporting, and other disposition of any Hazardous Substance encountered or used on the Project, whether or not the presence of such Hazardous Substances constitutes a Hazardous Environmental Condition;
- 3) Plans for initiating Remedial Actions in respect of any Hazardous Substances encountered on or used on the Project that constitute or could reasonably be expected to constitute a Hazardous Environmental Condition;
- 4) Procedures for coordination with the Department and other emergency response-related agencies and organizations; and
- 5) Procedures for submission of “incident” reports for releases of Hazardous Substances.

1.7 Right-of-Way (ROW) Acquisition and Relocation Plan

A. The ROW Acquisition and Relocation Plan will define the approach to acquisition of the Project ROW and will address:

- 1) The roles and responsibilities of the Developer and the Department for ROW acquisition and relocation;
- 2) The ROW acquisition and relocation process and procedures;
- 3) Applicable guidelines and Laws;
- 4) Procurement ROW acquisition and relocation services;
- 5) Coordination with the Department and property owners;
- 6) ROW acquisition costs management;
- 7) The use of RUMS;
- 8) The acquisition and relocation schedule;
- 9) Environmental concerns;
- 10) Document/records management, review standards, QA/QC process; and
- 11) Linkage with other relevant PDPs and the QMSP.

1.8 Utilities Plan

A. The Utilities Plan will define the utility coordination, adjustment, and relocation activities during the design and construction of the Project and will address:

- 1) The roles and responsibilities of the Developer, the Department, and Utility

- companies/owners;
- 2) Utility agency coordination plans and process;
 - 3) The Utility Relocation and adjustment process;
 - 4) Applicable guidelines, laws and regulation;
 - 5) The application of prior rights and cost allocations;
 - 6) The utility easement acquisition process
 - 7) Utility agreements including the Department Master Utility Agreement (“MUA”) and/or the development of Project specific utility relocation agreements;
 - 8) Relocations and adjustments of utility facilities included in the Developer’s Contract;
 - 9) Relocations and adjustments of utility facilities performed by the utility company or their contractor;
 - 10) The coordination with the Developer, the Department, Utilities, Utilities’ designers, and contractors;
 - 11) The identification and resolution of utility conflicts and interdisciplinary coordination;
 - 12) The development and maintenance of a Utility tracking report;
 - 13) The process for revising utility plan and estimates;
 - 14) The process of payment of utility company progress and final billings.
 - 15) The process for close out of utility relocations and processing as-built land use permit applications
 - 16) Identify monitoring and recording requirements;
 - 17) On-going monitoring and compliance records tracking system;
 - 18) The roles and responsibilities related to Developer provided MOT services for utilities and/or their contractors.
 - 19) Regularly updated impact on project schedule;
 - 20) Reporting and documentation mechanism;
 - 21) Linkage to other relevant PDPs and the QMSP;
 - 22) Ensure utility company compliance with Map-21 Buy America Certification.

1.9 Maintenance of Traffic (MOT) Plan

- A. The Developer shall develop a MOT Plan pursuant to Section 1.9 of the Technical Requirements. The MOT Plan will consider the impact of construction activities on the access and egress of traffic to the I-66 Corridor within the immediate construction zone and provide for a proactive approach to address the impact of such activities on the traveling public and transit providers.
- B. The MOT Plan shall be consistent with, and included as part of, the TMP for the Construction Period.

C. The MOT Plan shall include:

- 1) Construction phasing plans (including diagrams and narratives) plans shall include temporary drainage design to minimize travel lane flooding and preventing damage to adjacent property during construction; erosion and sediment control plans;
- 2) Detours and timeline schedules;
- 3) Emergency access plans for first responders and facilities such as hospitals, police stations, and fire stations;
- 4) Incident management coordination with the Department;
- 5) A description of the Developer's proposed approach for the development of detailed traffic control plans;
- 6) Coordination with the Communications Plan for the dissemination of construction-related communications;
- 7) A description of the process to be used for ongoing reviews of active work zones;
- 8) A description of the process to ensure all persons responsible for design, implementation, and inspection of work zone traffic controls are trained adequately; and
- 9) Coordination with other relevant PDP.

1.10 Communications Plan

- A. The Developer is expected to develop and maintain an effective Communications Plan in coordination with the Department throughout the Project's development, delivery, and operations period, as well as a public education and marketing plan to be implemented no less than twelve (12) months prior to Service Commencement. The Developer's Communications Plan at a minimum does the following:
- 1) Provides an effective framework for communication between the Developer, the Department, and stakeholders;
 - 2) Effectively supports and coordinates with the Department in engaging the community in the design, construction and operation of the Project to minimize negative impacts, and maximize positive outcomes;
 - 3) Effectively informs and engages the community, in coordination with the Department, in the operation of the Project to ensure public understanding of operations rules and requirements;
 - 4) Builds a strong and enduring relationship with stakeholders and the community within the I-66 Corridor over the life of the Project;
 - 5) Identifies and manages risks associated with the Project;
 - 6) Develops a strong and enduring brand relationship among the communities, I-66 Corridor drivers and the owners and operators of the Project;
 - 7) Maximizes public awareness of features and benefits of the 66 Express Lanes;

- 8) Ensures the public understands how best to use the 66 Express Lanes, and the requirements for travel on the system;
 - 9) Ensures consistency with the goals and established Transform 66 branding during the Construction Period of the Project;
 - 10) Provides a detailed outline of communication tools and strategies to be employed in support of and in coordination with the Department during each phase of the Project development, delivery and operation, including:
 - a) market research and analysis
 - b) media outreach
 - c) stakeholder outreach and information
 - d) department interface and liaison
 - e) project communication team
 - f) design-build phase– public information and involvement
 - g) pre-operations phase - public education and awareness
 - 11) Develop a Crisis Communications Plan and Procedures, addressing coordination with the Department and responsiveness to the media
 - 12) Reporting and documentation mechanisms;
 - 13) Linkage to other PDPs and the QMSP.
- B. The Developer shall develop a Public Information Plan (PIP) for the Work period as part of its overall Communication Plan.
- C. The PIP will fit within the context of the broader Communication Plan in support of and in coordination with the Department to address:
- 1) The identification of stakeholders and the outreach tactics that will be used to engage them
 - 2) Training of relevant Project personnel in crisis communications, media relations and community outreach techniques
 - 3) Development of a Community Engagement Program, outlining the approach to consulting with the community about design and construction matters, including:
 - a) mechanism to engage and communicate applicable design and construction activities to the community
 - b) communicate mitigation measures to directly impacted properties (dust, noise, access constraints, utility impacts, etc.)
 - c) hosting and supporting the Department in community information meetings to provide updated Project information as required
 - d) education and awareness related to public safety surrounding the work zone
 - 4) The approach to support and coordinate with the Department regarding communication with the public about construction activities, including:

- a) preparation of three-month look-ahead calendars detailing particularly impactful construction activities both to travelers and nearby communities
 - b) notification of forthcoming construction activity to surrounding homes and businesses
 - c) commitment of key Project staff to participate in community outreach activities such as public meetings and media interviews
 - d) commitment to provide information to assist the Department in responding to inquiries received through the Department's various hotlines
 - e) facilitation and maintenance of Project signage, including information to pedestrians and cyclists, and Project branding and information
 - f) planning for and communicating project activities impacting the public, such as changes to traffic patterns and pedestrian or bicycle access.
- 5) Advance delivery to the Department of information on expected, major traffic changes for inclusion in the Department public advertising, online communications, and media outreach programs. The information will include traffic-modeled estimates of time delay and queuing lengths. All advertising pertaining to construction-related lane closures and traffic impacts will be managed and executed, or approved, by the Department.
- 6) Provision of information to support the Department in communicating with motorists and stakeholders to facilitate the Maintenance of Traffic (MOT) during construction. This will include:
- a) packaging of all MOT information, such as anticipated delays and lane closures, for provision to the Department's Project Communication Team on a weekly and as-needed basis, to facilitate communication to the media, stakeholders and the broader community
 - b) communication with direct impact area property owners
 - c) communication with elected officials and other key stakeholders in coordination with the Department
 - d) coordination with local agencies
 - e) notification program to inform motorists and the broader community including bicylists and pedestrians about expected traffic changes/delays (such as on-road signage, SMS and email alerts)
 - f) information to stakeholders about events in the area that may be affected by construction activities
- 7) Coordination of construction-related information for inclusion on all Project communication material as developed under the Communication, Marketing and Public Outreach Plan (including web, bulletins, etc.)
- 8) Management of construction site tours, including stakeholder events
- 9) Recording of Project progress through photography and sharing of photography with the Department for use in communications and outreach efforts

- 10) Reporting and documentation mechanism
- 11) Linkage to other relevant PDPs and the QMSP.

1.11 DBE/SWaM Plan

- A. The DBE/SWaM Plan will define the approach to meet the DBE/SWaM participation goal and will address:
- 1) The proposed method to achieve the DBE/SWaM participation goal or demonstrate a good faith effort to meet the goal;
 - 2) A proactive DBE/SWaM outreach program for DBE/SWaM participation;
 - 3) The reporting requirements to the Department regarding DBE/SWaM participation;
 - 4) Regular updates on the progress in meeting DBE/SWaM requirements;
 - 5) On-going tracking of efforts and corrective actions required and how they have been met;
 - 6) Reporting and documentation mechanism; and
 - 7) Linkage to the other PDPs and the QMSP.

1.12 Health, Safety and Security Plan

- A. The Health, Safety and Security Plan will define the health, safety and security activities required during the design and construction of the Project and will address:
- 1) The health and safety policy for the Project;
 - 2) The health and safety goals for the Project;
 - 3) The organization and responsibilities of the various positions related to health, safety and security;
 - 4) Construction occupational health and safety;
 - 5) The Project health and safety rules and regulations;
 - 6) Site security;
 - 7) Documented procedures on meeting the health and safety requirements for the Developer and its Contractors and suppliers;
 - 8) On-going tracking of efforts and corrective actions required and how they have been met;
 - 9) Reporting and documentation mechanism;
 - 10) Linkage to other relevant PDPs and the QMSP.

1.13 Operations and Maintenance Plan

- A. The Operations and Maintenance Plan will identify the methods, systems and procedures whereby the Developer will comply with the operation and maintenance requirements of the Agreement.

- B. It is intended to address routine and seasonal operation and maintenance planning and activities.
- C. The Operations and Maintenance Plan shall be consistent with or include as its components, and address the following areas, consistent with the approach noted earlier for the PDPs during the design and construction phase:
 - 1) Developer Management Plan
 - 2) Document Management Plan
 - 3) Quality Management System Plan
 - 4) Life Cycle Maintenance Plan
 - 5) Communication, Consultation, Public Outreach, and Community Engagement Plan (which includes Public Information Plan)
 - 6) Environmental Management Plan
 - 7) Transportation Management Plan
 - 8) DBE/SWaM Plan
 - 9) Health, Safety and Security Plan
 - 10) Tolling operations and maintenance shall be addressed as a separate component of the Operations and Maintenance Plan
 - 11) Severe Weather Plan, including snow and ice removal in the Express Lanes
- D. The Operations and Maintenance Plan shall address the following:
 - 1) Organization structure including key operations and maintenance personnel and their responsibilities and level of authority;
 - 2) Key suppliers and subcontractors;
 - 3) Service delivery and operating procedures;
 - 4) Incident management;
 - 5) Inspection methods and inspection schedule;
 - 6) Identification and scheduling of routine maintenance;
 - 7) Stakeholder communication program;
 - 8) Environmental compliance;
 - 9) Site safety;
 - 10) Emergency response;
 - 11) Tolling operations and maintenance plan;
 - 12) Documentation and reporting procedures;
 - 13) An internal audit program and recording of findings, conformance, non-conformance, corrective actions and preventative actions;
 - 14) Making available documentation for external audits;

- 15) Submission of reports indicating all activities and requirements as noted in the Technical Requirements;
- 16) Submission of annual operations and maintenance report addressing the requirements in the Technical Requirements.
- 17) Reporting and documentation mechanism;
- 18) Coordination with other projects; and
- 19) Linkage to other relevant PDPs and the QMSP.

1.14 Life Cycle Maintenance Plan (LCMP) (operations phase)

- A. The Life Cycle Maintenance Plan shall address the following:
 - 1) The Life Cycle Maintenance Plan will be developed in accordance with Section 9.04 of the Agreement.
 - 2) The Life Cycle Maintenance Plan shall establish the procedures for successful management of maintenance, operation and handover of the assets to the Department
 - 3) The Life Cycle Maintenance Plan is intended to focus on analyzing conditions of assets to identify, quantify, prioritize and/or defer major maintenance, repair, reconstruction, rehabilitation, restoration, renewal, replacement, enhancement new addition, or decommissioning in order to maintain safety, effectiveness and efficiency desired in the future and help make decisions about resources required to attaining this condition in terms of scope, risks, costs and timeline. LCMP scope, findings and recommendations are greater than expected routine maintenance activities, such as preventative, annual or seasonal maintenance which are necessary for asset preservation. LCMP shall provide an accurate portrayal of the current and projected status of the assets under the control of the Developer.
- B. The Life Cycle Maintenance Plan shall be updated annually and submitted to the Department for review and approval.
- C. The Life Cycle Maintenance Plan shall clearly identify activities planned, organization, implementation, and quality management measures employed by the Developer to optimize asset longevity.

1.15 Joint Operation and Maintenance Protocol (JOMP)

- A. The JOMP will define the protocols for the operation and maintenance of 66 Express Lanes, consistent with all the requirements of the Agreement which shall include but not limited to the following:
 - 1) Operation and Maintenance Responsibility Matrix- Develop an Operations and Maintenance Responsibility Matrix in an excel spreadsheet format to include columns for responsible department; governing document / section; citation of governing document; oversight description, whether routine or extraordinary; whether a recurring task; frequency; responsible party; task of responsible party.

- 2) Operation and Maintenance Plan
 - 3) Life Cycle Maintenance Plan
 - 4) Department and Developer key personnel contact list
 - 5) Current Department's Lane Closure Policy
 - 6) Current copy of Performance Requirements of Department maintenance contract ("TAMS contract")
 - 7) Emergency Access Protocol for Maintenance
 - 8) Snow and Ice Removal Plans
 - 9) Express Lanes Operational Responsibility Calendar- Create a monthly-based excel table/calendar from the Operation and Maintenance Responsibility Matrix and update when necessary, but at a minimum on an annual basis. Include in the monthly cells: the governing document; description of responsibility; and frequency throughout the year.
- B. If any provision of this JOMP should be in conflict with any provision of the Agreement or any exhibits to the Agreement, then the Agreement or any such exhibit shall govern.

Submission Timetable

Project Development Plans shall reflect implementation status and must be updated in accordance with the following table, or earlier if required by the Project Agreements.

Project Development Plan	PDP submission date for review by Department	Updates *	Department Review Input
Developer Management Plan	Within 45 Days of issuance of LNTP	Annually (during the Term)	Review and approve
Document Management Plan	Submitted and approved as a condition for issuance of the Construction NTP	Quarterly, if required (during the Construction Period)	Review and approve
Quality Management System Plan	After issuance of LNTP and approved as a condition of the Construction NTP	Monthly reporting & quarterly updates, if required (during the Construction Period)	Review and approve
Design Quality Management Plan	After issuance of LNTP and approved prior to first design package submittal	Quarterly, if required (during the Construction Period)	Review and approve

Project Development Plan	PDP submission date for review by Department	Updates *	Department Review Input
Construction Quality Management Plan	Submitted and approved as a condition for issuance of the Construction NTP	Quarterly, if required (during the Construction Period)	Review and approve
Environmental Management Plan	After issuance of LNTP and approved as a condition for issuance of the Construction NTP	Quarterly, if required (during the Construction Project); Annually, if required (during the remainder of the Term)	Review and approve
ROW Acquisition and Relocation Plan	After issuance of LNTP and approved as a condition for issuance of the Construction NTP	Quarterly, if required (during the Construction Project)	Review and approve
Utilities Plan	After issuance of LNTP and approved as a condition for issuance of the Construction NTP	Quarterly, if required (during the Construction Project)	Review and approve
Maintenance of Traffic Plan	Submitted and approved as a condition for issuance of the Construction NTP	Quarterly, if required (during the Construction Project)	Review and approve
Communications Plan	Within 45 Days of issuance of LNTP	Annually, if required (during the Term)	Review and approve
DBE/SWaM Plan	Submitted and approved as a condition for issuance of the Construction NTP	Quarterly, if required (during the Term)	Review and approve
Health, Safety and Security Plan	After issuance of LNTP and approved as a condition for issuance of the Construction Notice to Proceed	Quarterly, if required (during the Construction Period); Annually, if required (during the remainder of the Term)	Review and approve
Operations and Maintenance Plan**	Submitted a minimum of 6 months prior to anticipated Project Completion and approved as a condition for Project Completion	Monthly: Operations and Maintenance status and update reports. Annually: Operations and Maintenance Plan update and report on previous year activities	Review and approve
Life Cycle Maintenance Plan (operations phase)	Submitted a minimum of 6 months prior to anticipated Project Completion and approved as a condition for Project Completion	Annually	Review and approve

Project Development Plan	PDP submission date for review by Department	Updates *	Department Review Input
JOMP	Submitted a minimum of 6 months prior to anticipated Project Completion	Annually	Review

* Plans, records and logs shall be available for review by the Department on an ongoing basis in accordance with the Agreement. Changes as required will be in accordance with these Technical Requirements. The term “updates” in this column means updates to the already-approved PDPs.

** The Operations and Maintenance Plan shall reference the Operations and Maintenance Plan the Developer drafted for the Texas DOT North Tarrant Express project, Version 5 dated as of August 19, 2015 (TxDOT NTE O&M Plan); *provided, however*, the TxDOT NTE O&M Plan shall not preclude any requirements of these Technical Requirements. The TxDOT NTE O&M Plan is an existing plan that demonstrates a level of commitment to operate and maintain that facility in a manner commensurate with these Technical Requirements. The Developer shall ensure the Operations and Maintenance Plan for the Project is developed, maintained, and meets or exceeds the same level of commitment as that contained in the TxDOT NTE O&M Plan in terms of operational activities and maintenance requirements. For the avoidance of doubt, to the extent that any requirements of the TxDot NTE O&M Plan are in conflict or are consistent with the requirements of these Technical Requirements or any of the Project Agreements, the Project Agreements shall control and be interpreted in conformance with Section 25.16 of the CA.

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 1.5

Standards and Specifications

The standards, special provisions and reference guides applicable for the Construction Period shall be the version of those documents as noted herein below or those in effect as of final issuance of the RFP, including all supplements, errata, revisions and interims. Following the Work period, all subsequent design and construction must meet the standards current at the time the Work is performed. Groupings of standards are for ease of reference only and certain reference documents have been included. It is the responsibility of the Developer to ensure that all relevant standards and specifications have been applied.

The Developer must verify and use the latest version of the documents listed herein. The Developer shall meet or exceed the minimum design standards and criteria.

1. Standards and References Documents

General

1. AASHTO Guide Specifications for Highway Construction, 9th Edition
2. VDOT Materials Approved Lists
3. VDOT Construction Manual (2005, revised July 2008)
4. VDOT Post Construction Manual (August 2014)
5. VDOT Construction Inspection Manual (January 2015)
6. VDOT's Minimum Requirements for Quality Assurance & Quality Control on Design-Build & Public-Private Transportation Act Projects January 2012
7. VDOT Traffic Engineering Design Manual (2014)
8. VDOT Right of Way Manual of Instructions, Third Edition (January 1, 2016)
9. VDOT Utility Manual of Instructions – Utility Relocation Policies and Procedures, Tenth Edition (Rev 10/1/2014)
10. VDOT Land Use Permit Regulations Guidance Manual (3/17/2010)
11. VDOT Land Use Permit Regulations 24 VAC 30-151 (3/17/2010)
12. VDOT Policy Manual for Public Participation in Transportation Projects (Rev September 2015)
13. VDOT Instructional & Information Memorandums (IIM) – All Divisions (as of date of RFP)
14. VDOT Road and Bridge Standards, Vol. 1 and Vol. 2 (2008), including all revisions as of the date of the RFP
15. VDOT Road and Bridge Specifications (2016)
16. VDOT Virginia Work Area Protection Manual (2011) (Revised April 2015)
17. 2010 ADA Standards for Accessible Design
18. Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way, dated July 26, 2011

19. Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities dated July 23, 2004 and amended May 7, 2014
20. VDOT Policy for Integrating Bicycle and Pedestrian Accommodations, adopted March 18, 2004 by the CTB
21. Transportation Research Board Highway Capacity Manual (2010)
22. VDOT Manual of Instruction for Material Division Revised November 2015 to include all associated memorandum
23. VDOT CADD Manual (2012)
24. Revisions to VDOT CADD Manual (June 2015)
25. VDOT State Noise Abatement Policy (July 13, 2011)
26. ISO 9001 Quality Management Systems September 2015
27. AASHTO Guide for Park-and-Ride Facilities, 2nd Edition
28. Virginia Uniform Statewide Building Code (2009)
29. Uniform Relocation Assistance and Real Property Act of 1970, as amended (as of date of RFP)
30. 1950 Code of Virginia, Titles 25.1 and 33.1, as amended (as of date of RFP)
31. Traffic Operations Analysis Tool Guidebook Version 1.1 (2013)
32. VDOT Asbestos Project Monitoring and Clearance Air Monitoring Procedures
33. VDOT Guidelines For Management Of Contaminated Soils Associated With Utility Installation And Maintenance Activities

Roadway Design

1. VDOT State Bicycling Policy Plan (September 2011)
2. VDOT Road Design Manual (all revisions as of July 2015)
3. AASHTO A Policy on Geometric Design of Highways and Streets, 6th Edition (2011)
4. AASHTO Roadside Design Guide, Fourth Edition, October 2011 (updated chapter 6)
5. AASHTO: A Policy on Design Standards Interstate System, 5th Edition (January 2005)
6. AASHTO – Guide for High-Occupancy Vehicle (HOV) Facilities, 3rd Edition (2004)
7. AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012)
8. AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, July 2004
9. AASHTO Guide for Geometric Design of Transit Facilities on Highways and Streets, 1st Edition, 2014

Geotechnical and Pavement Design

1. VDOT Soil Design Parameters for Sound Barrier Walls, Retaining Walls and Non-Critical Slopes – April 14, 2011
2. VDOT Requirements for Geotechnical Investigation, Geotechnical Design and Minimum Pavement Sections for the I-66 Outside the Beltway Corridor Improvements Project, June 15, 2016
3. AASHTO Guide for Design of Pavement Structures (Rigid Pavement and Flexible Pavement) (1993 Edition and subsequent revisions)
4. AASHTO Manual on Subsurface Investigations (1988)
5. VDOT Pavement Design Guide for Subdivision and Secondary Roads, 2014
6. VDOT Manual of Instruction for Material Division
7. VDOT Manual of Structure and Bridge Division, Volume V – Part 11 Geotechnical Manual for Structures
8. FHWA 23CFR626 - Part 626 Pavement Policy – April 1, 2011
9. Development and Implementation of Pavement Condition Indices for the Virginia Department of Transportation: Phase I – Flexible Pavements – September 2002

Structures

1. VDOT Manual of Structure and Bridge Division, Vol. V Series (as of date of RFP)
2. AASHTO Guide Specification for LRFD Seismic Bridge Design, 2nd Edition, 2012; 2014 and 2015 Interim Revisions
3. AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications
4. AASHTO Standard Specifications for the Design of Highway Bridges, 16th Edition, 1996; 1997 and 1998 Interim Specifications; and VDOT Modifications
5. AASHTO Construction Handbook for Bridge Temporary Works, 1st Edition, 1995, 2008 Interim
6. AASHTO Guide Design Specifications for Bridge Temporary Works, 1st Edition, with 2008 Interim Revisions
7. AASHTO Manual for Bridge Evaluation, 2nd Edition, 2011, 2013, 2014, and 2015 Interim Revisions
8. AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, 1994 Edition
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Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 1.8

Lane Closure Guidelines for Northern Virginia and Lane Closure Policy

VDOT I-66 Program Lane Closure Policies and Procedures

Date Issued: _____

Revision Date: _____

**Virginia Department of Transportation
4975 Alliance Drive
Fairfax, VA 22030**

Table of Contents

1. Overview of Virginia I-66 Program Lane Closure Policy	1
1.1 Overview	1
1.2 Process	1
2. Virginia I-66 Program Lane Closure Process	3
2.1 Lane Closure Types (<i>See Technical Requirements Section 1.8.3.E</i>)	3
2.2 Advance Notification Requirements (<i>See Technical Requirements Section 1.8.3.E</i>).....	3
2.3 Advance Notification Limits	3
2.4 State/County Police Support	3
2.5 Lane Closure Request.....	3
2.6 Notification of Lane Closures	4
3. Virginia I-66 Program Lane Closure Restrictions	7
3.1 General Restrictions	7
3.2 Inclement Weather Restrictions	7
4. Virginia I-66 Program Lane Closure Information	9
5. Virginia I-66 Program Lane Closure Contact List	10

Attachments

Attachment 1: Virginia I-66 Program Lane/Shoulder Closure Request Form

Attachment 2: District Administrator Lane Closure Guidance Document

SECTION 1

1. Overview of Virginia I-66 Program Lane Closure Policy

1.1 Overview

This policy standardizes the the lane closure management process for identifying the location, date, and time of all lane closures, shoulder closures, and work zones on all interstate, primary, and certain secondary roads within the Virginia I-66 Program construction zones.

It provides contact information for the appropriate public safety organizations; local, county, and state agencies; and project staff and media partners to notify them of the lane closures and work zones' effective time restrictions and to facilitate community outreach within the MegaProjects corridors to avoid undue impacts to motorists.

Section 1.8 of the Technical Requirements provides work hours and hours for roadway lane and shoulder closures for the Virginia I-66 Program.

1.2 Process

Developers for the Virginia I-66 Program construction projects shall use the Virginia I-66 Program Lane Closure Request Form (Attachment 1) to request lane and shoulder closures and submit it electronically to the Virginia I-66 Program Lane Closure Management Team and the respective VDOT Project Manager for approval. The work hours for these closures shall comply with the contract agreements and the hours shown in Section 1.8 of the Technical Requirements for the various types of closures. This process will facilitate the coordination between projects and identify lane/shoulder closing conflicts that may occur during the various project activities.

Normally, short term lane closures do not require Maintenance of Traffic (MOT) or Temporary Traffic Control Plans (TTCP). However, short term closures for bridge erection, major traffic shifts, detours or other significant or complex activity will require MOT or TTCP plans. When required, the Developer will submit additional Maintenance of Traffic (MOT) information and/or approved traffic control plans (TCPs) (not applicable to the DCMP) in advance of submitting its lane closure requests. For the DCMP, the Department will review the TCPs and provide comments to the Developer within 21 days of receipt of the project or 15 business days.

All requests shall include sufficient information to support the local and regional public information programs describing the location, dates and times, nature of work, lanes to close, ramp closures, field point of contact, and detours (if any). The advance notification requirements for the type of lane closure requested are defined to support the coordination efforts within each project contract agreement.

The lane closure requests shall be submitted to the Virginia I-66 Program Lane Closure Management Team (Section 5 – Contact List) and the VDOT Project Manager by noon each Wednesday of the week before the lane closure is required. This allows the Lane Closure Management Team to review the request for time of work requirements and conflicting closures within the Virginia I-66 Program, as well as to validate traffic operations and incident management impact(s) before submitting it to the VDOT Project Manager for a technical review. Once reviewed and approved, the Developer shall input the lane closure information into the Lane Closure Advisory Management System (LCAMS). The Traffic

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Operations Manager will furnish the necessary information to the various outreach programs and Virginia I-66 Program staff as appropriate.

The Traffic Operations Manager will submit the request to the VDOT Project Manager for approval or disapproval. The respective VDOT representative(s) will review the Virginia I-66 Traffic Operations Manager's recommendations and will either approve the request or return it to the Developer for resubmission through the MegaProjects Traffic Operations Manager.

If conflicting lane closures are identified, the Lane Closure Management Team will notify the Developer to coordinate and eliminate the conflicts. If the Developer cannot resolve a conflict, the respective VDOT Project Manager will facilitate the resolution of conflicts between projects. Once the conflict is resolved, the VDOT Project Manager will notify the Traffic Operations Manager of the resolution and have the Developer resubmit the lane closure request.

Lane closure approval/disapproval will be made within three (3) calendar days of receipt of the request from the Virginia I-66 Traffic Operations Manager. The Construction Project Management Schedule shall provide a rolling 2- or 3-week plan of the MOT project requirements.

Once approved, the Developer shall use LCAMS to convey approved lane closures to the VDOT Northern Region Operations Traffic Operations Center (NROTOC) for internal management and to the Virginia I-66 Program public affairs personnel for appropriate outreach to external parties, such as media, businesses, trucking associations, traffic reporting agencies, and community service agencies.

SECTION 2

2. Virginia I-66 Program Lane Closure Process

2.1 Lane Closure Types *(See Technical Requirements Section 1.8.3.E)*

2.2 Advance Notification Requirements *(See Technical Requirements Section 1.8.3.E)*

2.3 Advance Notification Limits

The Developer's working CPM schedule shall identify the activities that require lane and roadway closures. The Construction Managers and MOT team will review the schedule to ensure that the closure requested meets the objective of the project and will minimize traffic disruptions.

Lane closures, shoulder closures, and work restrictions due to Holidays and special events are specified in Section 1.8 of the Technical Requirements.

Failure to restore full traffic capacity within the time specified will result in a disincentive charge being assessed on the Developer's next month's pay estimate, in conformance with the rates set in the I-66 Program Comprehensive Agreement. Restoration of traffic capacity shall mean the completion of all construction work, the removal of all traffic control devices and signs, and the removal of all workers, materials and equipment from the roadway, lane and/or shoulder.

The VDOT Project Manager has the right to direct the Developer to modify, adjust or remove lane closures based on traffic or weather conditions.

2.4 State/County Police Support

The Developer will be required to provide a uniformed, off-duty law enforcement officer with a law enforcement vehicle equipped with emergency light for all nighttime work that is performed within the travel lanes. Provision of this service will be the responsibility of the Developer for the I-66 project only.

When requesting police assistance from State and Local Departments, the Developer shall coordinate all requests through the respective departments

2.5 Lane Closure Request

The Developer will submit a Virginia I-66 Program Lane Closure Request Form to the VDOT Project Manager and Virginia I-66 Program Traffic Operations Manager.

The request for a lane closure will be submitted in accordance with each project contract requirements which include Comprehensive Agreement project advance notification requirements for the type of the lane closure requested (*Exhibit 1: Lane Closure Approval and Notification Process*).

The Developer shall submit the lane/shoulder closure requests electronically on the attached form or an approved alternate form (*Attachment 1: Virginia I-66 Program Lane/Shoulder Closure Request Form*).

The VDOT Project Manager and Traffic Operations Manager will review all lane closure requests (*Exhibit 1*). The Traffic Operations Manager will review each request for conflicting closures or special events that may occur during the same time or location and for impacts to traffic operations and incident management. The Traffic Information Coordinator will verify work hours and compliance with any contract requirements. The Traffic Operations Manager will review the proposed closure to verify compliance against contract MOT plans and approved TCP, and to coordinate proposed closures with Virginia I-66 Program personnel.

If the Developer deviates from the contract approved lane closures hours (*Technical Requirement Section 1.8, Table 1.8a, Table 1.8b*), the Developer shall prepare a traffic analysis to assess the traffic impacts in advance of the lane closure requests being submitted. Traffic analysis and modeling shall also be required for all construction activities requiring a detour, requiring closure of multiple lanes, or deviating in any way from Approved Final Construction MOT phasing. The Developer shall provide adequate justification for the deviation of approved hours or MOT phasing is required which should include but not limited to the following information:

1. Justification to determine if this option is the only practical option.
2. Provide list of other options that have been considered.
3. What mitigation and backup plans will be in place?
4. Develop detour plan.
5. Public outreach plan to start a month prior to closure.
6. Plan for coordination with localities a month prior to closure.
7. Provide evidence of how implementing this option will minimize the duration of construction activities and lane closures.

Once the revised lane closures hours of operations have been approved, the project and Developer traffic operations staff must implement the coordination and outreach plan at a minimum 3 weeks in advance of the implementation of major closures.

2.6 Notification of Lane Closures

The Traffic Information Coordinator will provide the following stakeholders current information regarding approved lane closures planned within the project limits. The names, phone numbers and email addresses are in Section 6.

Departments of Transportation

- VDOT District Office
- VDOT- NROTC
- Maryland State Highway Administration's Coordinated Highway Action Response Team (CHART)
- District of Columbia DOT

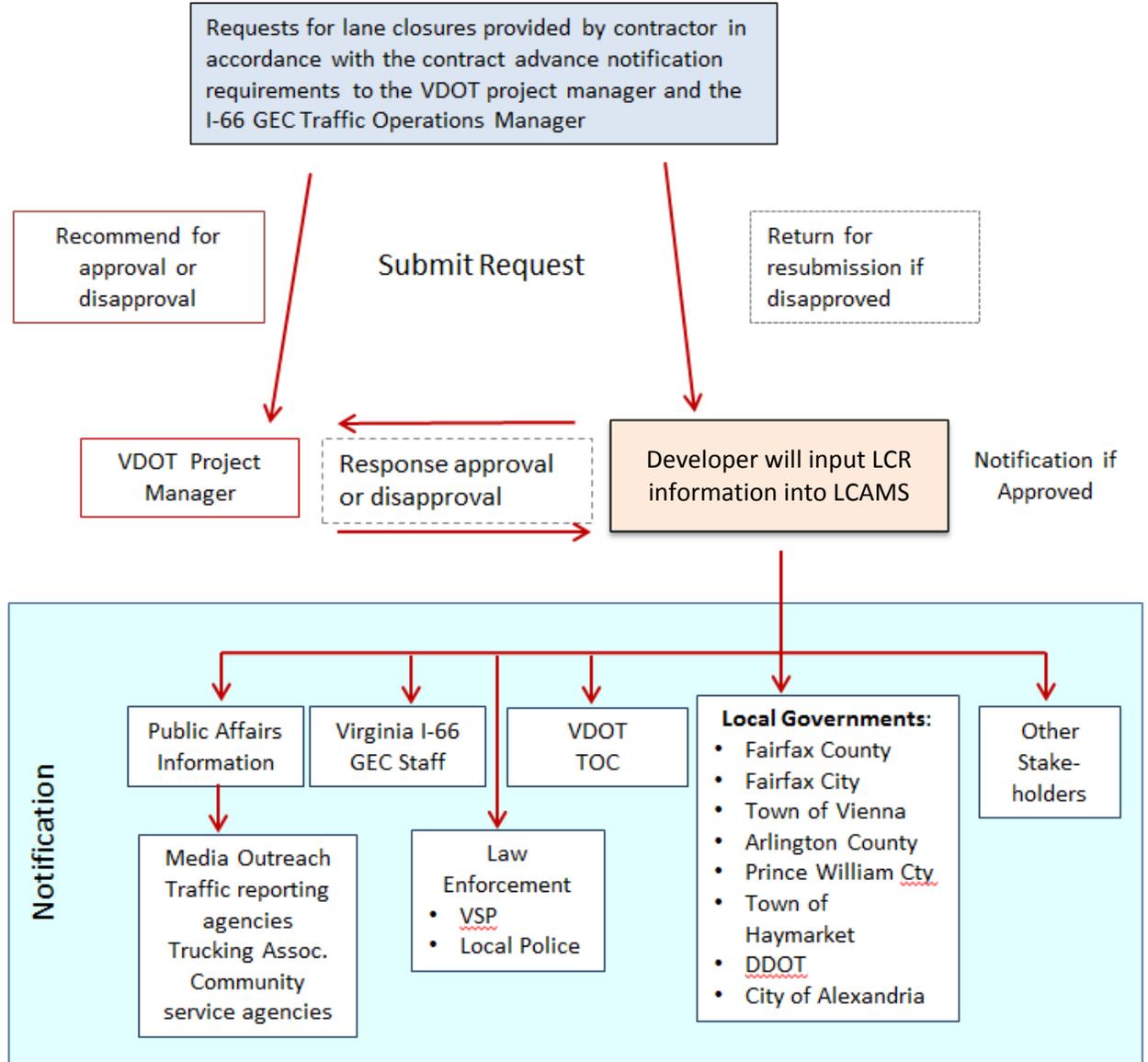
Virginia I-66 Program Communications Team - City, County, State and other agencies

- Police Agencies
- City of Fairfax
- Fairfax County
- National Park Service (U.S. Dept. of Interior)

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- Washington Metropolitan Area Transit Authority
- Fire and Rescue Departments
- Arlington County Public Works
- Fairfax County Public Works
- Schools
- I-95 Corridor Coalition
- Traffic reporting agencies
- Trucking associations
- Adjacent construction projects
- Prince William County
- Fauquier County
- Loudoun County
- Transit
- Town of Haymarket
- Metropolitan Area Transportation Operations Coordination (MATOC)

Exhibit 1 - Lane Closure Approval and Notification Process



SECTION 3

3. Virginia I-66 Program Lane Closure Restrictions

3.1 General Restrictions

Lane closure requests shall be submitted to comply with the work hour restrictions specified in Section 1.8 of the Technical Requirements. Requests shall include any pertinent information or TCPs if required.

Lane closures, shoulder closures, and work restrictions due to Holidays and special events are specified in Section 1.8 of the Technical Requirements.

The Department reserves the right to monitor traffic conditions affected by the work and to implement additional restrictions as necessary (for example, terminate a lane closure early). Additional restrictions for other holidays or special local events may be necessary.

In case of an emergency or accidents, the construction access lanes on the shoulder within the project or lane closure limits shall be available when feasible for emergency vehicles.

Pull-off areas shall be provided in accordance with the Virginia Work Area Protection Manual to provide a place for disabled vehicles.

The Developer shall notify the VDOT NROTOC at the starts of lane closure set up and once the the closure is completely removed at (703) 877-3450.

The VDOT Project Manager has the right to modify, adjust or remove lane closures based on traffic and weather conditions.

The Virginia I-66 Program Traffic Information Coordinator will notify the Traffic Operations Manager and representatives from Virginia State Police, VDOT NROTOC, and MD SHA State Operation Center of a lane closure cancellations or delays.

3.2 Inclement Weather Restrictions

The Department may restrict the implementation of lanes closures as result inclement weather that may include heavy rains, icy road conditions and heavy snow events. These restriction are necessary for the safety of the traveling public and workers treating the roadways. The following table are the lane clsure restrictions during winter inclement weather events.

Exhibit 2 – Lane Closure Weather Restrictions

Weather Forecast	Mob. Level	VDOT Response Plan	I-66 Program Restrictions
Precipitation: 20% or Greater Accumulation: Ice/Snow Possible Ambient or Pavement Temp: 30-36	Anti-Ice	I-66, Spot Treatment of Other Critical Structures & Locations	Lane closures permitted but must allow VDOT to treat the roads
Precipitation: 20-49% or greater Accumulation: Snow Possible Ambient or Pavement Temp: 30-36	Skeleton Crews	Spot Treatment of Critical Structures & Locations Respond to Icy Conditions As needed	Lane closures permitted but must allow VDOT to treat the roads
Precipitation: 20-49% or greater Accumulation: Snow Possible Ambient or Pavement Temp: 30-36	1	I-66, Spot Treatment of Other Critical Structures & Locations	Lane closures are permitted on case by case basis with prior approval
Precipitation: 50-100% Chance Accumulation: Up to 1 inch of snow Ambient or Pavement Temp: 25-29	2	Light Salting Operation; Limited Work in Subdivisions. Includes Cold Spot Treatment in Subdivisions & Gravel Roads	No lane closures permitted on major roadways.
Precipitation: 50-100% chance Accumulation: Up to 2 inches of snow or up to 1/10 inch of ice Ambient or Pavement Temp: 20-24	3	Salting Operation; Potential for Plowing; Includes Cold Spot Treatment in Subdivisions & Gravel Roads	No lane closures permitted on any roadways.
Precipitation: 50-100% chance Accumulation: Up to 6 inches of snow or up to 1/4 inch of ice Ambient or Pavement Temp: 15-19	4	Salting/Plow Operation; Includes Plowing Subdivisions & Sanding as Necessary	No lane closures permitted on any roadways.
Precipitation: 50-100% chance Accumulation: More than 6 inches of snow or more than 1/4 inch of ice Ambient or Pavement Temp: 10-14	5	Salting/Heavy Plow Operation; Includes Plowing Subdivisions & Sanding as Necessary. ALL RESOURCES ARE DEPLOYED!	No lane closures permitted on any roadways.

The Developer requesting lane closures during the period the restrictions are in place shall submit the LCR to the Traffic Information Coordinator for consideration for approval one day in advance.

SECTION 4

4. Virginia I-66 Program Lane Closure Information

The following information is required when submitting a lane closure request for approval (*Attachment 1*):

1. Highway: Highway number designation
2. Project Number: (If applicable)
3. Direction: West/East or North/South
4. Lane closure type: 1, 2 or 3 (see Section 2)
5. Date(s) Scheduled: Date/time from/to
6. Nature of work: boring, milling or asphalt overlay, etc. (use plain English for description)
7. Limits: location of beginning and end points
8. Number of lanes on roadway
9. Lanes/shoulders to be closed: (specify left, right, middle, left middle, right middle or shoulder)
10. Ramp location to be closed
11. Point of contact (POC): (Field Inspector Name)
12. POC telephone number
13. Type of Typical Traffic Control: TTC from Virginia Work Area Protection Manual
14. Traffic Control Plan required: (Any TCP deviating from TTC from the VAWAPM) Yes or No
15. TCP Approved - Yes or No and Approved TCP number
16. Any detours required: Provide details of detour route
17. Notes: Any other pertinent information that may be needed to facilitate closures
18. Police request: Yes or No; number of troopers/officers requested
19. Traffic Operations Manager review: *Signature*
20. Traffic Operations Manager recommendation: Approved or disapproved
21. VDOT Project Manager Approval: *Signature*

SECTION 5

5. Virginia I-66 Program Lane Closure Contact List

The coordination of all work zones related to the Virginia I-66 Program requires an extensive effort to coordinate and notify major stakeholders such as local, county and state agencies project staff and media partners. The following is the contact information for these groups:

VDOT NRO Transportation Operations Center

Candice Gibson
Office: 571-350-2060
Email: Candice.Gibson@VDOT.Virginia.gov

Transportation Operations Center
Office: 703-877-3450
Email: NROSTC@VDOT.Virginia.Gov

Maryland Traffic Operations Center-CHART

TOC
Office: 410-582-5605
Fax: 410-582-9853

Media and Public Affairs

Michelle Holland
Office: 571-483-2591
Email: michelle.holland@vdot.virginia.gov

State and Local Fire and Police Departments

Fairfax County Police

Richard McEachin
Office: 703-280-0558
Cell: 571-238.2972
Email: Richard.mceachin@fairfaxcounty.gov

Fairfax County Fire & Rescue

Battalion Chief John Price
Office: 571-221-1299
Email: John.Price@fairfaxcounty.gov

Prince William County

Captain Shana Hrubes
Office: 703-792-7200
Email: shrubes@pwcgov.org

Captain Phil Cecere
Email: pcecere@pwcgov.org

Prince William County Fire & Rescue

Virginia State Police

Contact: Capt.. James DeFord
Office: 703-803-2617
Email: James.Deford@vsp.virginia.gov

Contact: 1st Sgt. Neil Johnson
Office: 703-323-4524
Email: Neil.Johnson@vsp.virginia.gov

Maryland State Police

Contact: Duty Officer
Office: 301-568-8101
Fax: 301-735-1693

Others

Virginia Trucking Association

Contact: Dale Bennett
Phone 804-355-5371
Fax: 804-358-1374
Email: dbennett@Vatrucking.org

Maryland Motor Truck Association

Contact: Anne Ferro
Phone 410-644-2537
Fax: 410-644-2537
Email: aferro@mmtanet.com

American Trucking Association

Contact: Clayton Boyce
Phone 703-838-7935 ext. 1895
Fax: 703-684-4326
Email: cboyce@trucking.org

Traffic Reporting Agencies

Rachel Crowson
Metronetworks News Director
Office: 301-628-2712
Email: rachel_crowson@metronetworks.com

Ron Balcersek
Clear Channel Communications
Email: RonBalcersek@clearchannel.com

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Virginia I-66 Program Lane Closure Management

Traffic Information Coordinator
TBD
Phone: TBD
Email: TBD

Traffic Operations Manager - TBD
Phone: TBD
Email: TBD

Virginia I-66 Program VDOT Program Management

VDOT Regional Transportation Program Director

Susan Shaw
Phone: 703-259-1995
Email: Susan.Shaw@vdot.virginia.gov

GEC Lane Closure & MOT Coordination Program Management

TBD, Program Manager
Phone: TBD
Email: TBD

I-66 Project Manager

TBD (Approving Authority)
Phone: TBD
Email: TBD

Attachments

Attachment 1: Virginia I-66 Program Lane/Shoulder Closure Request Form

Date of Request: _____

Highway: _____ Project No: _____
Direction: _____ Lane Closure Type: _____

Date(s) Scheduled: _____ Time: From: _____

Nature Of Work: _____
Limits: _____

Existing Lanes: _____ Lanes/Shoulder Closed: _____
Ramps Closed: _____
Point of Contact _____
POC Telephone number: _____
Type of TTC: _____

TCP Required: Yes No TCP No: _____

TCP Approved: Yes No _____

Detour: _____

Notes: _____

Police Present: Yes No No. Of Troopers/officers: _____

Traffic Operations Manager Review: _____
Traffic Operations Manager Recommends: Approval Disapproval of Request _____

VDOT Approval: _____

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Lane Closure	Minimum	Maximum Advance Notice
1	10 Days	21 Days
2	5 Days	14 Days
3	3 Days	14 Days

Attachment 2: District Administrator Lane Closure Guidance



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
4975 Alliance Drive
Fairfax, VA 22030

GREGORY A. WHIRLEY
COMMISSIONER

MEMORANDUM

Date: March 23, 2012
To: Assistant District Administrators
Section Heads
Subject: Lane Closures

Our staff has worked hard through the personnel changes of the last few years to focus and ensure successful outcomes with a full design, construction and maintenance workload. However, I believe because of the higher personnel turnover we have lost some of our base of corporate knowledge during this time.

One basic area needing reemphasis is lane closure management. In the past nine months, we have had a number of cases where a lane has been closed during peak or near peak travel times. These cases have at times involved most if not all of the functional areas from design through construction or maintenance. Please review and emphasize the following guidelines with your sections, our consultants, maintenance contractors, and permittees:

1. Taking a lane during or near the peak period is an absolute ***last resort***. It is a last resort because we don't want the "cure" to be worse than the disease. It is even less desirable when the closure is on an Interstate/Primary/High Volume Secondary, in the dominant direction, lasts longer than a few days, and there hasn't been a media blitz starting a minimum of 10 to 14 days in advance of the planned closure.
2. Additionally, unless it is an emergency, the recommendation to do a closure during peak period needs to be presented to the Assistant District Administrator responsible for the action well prior to the contract being submitted or the closure being planned.

The recommendation to the Assistant District Administrator needs to include:

- How this is the only practical option.
- Other options that have been considered.
- What mitigation and backup plans will be put in place?
- The detour plan.
- The media plan to start a month prior to closure.
- Plan for coordination with the localities a month prior to closure.
- How the duration of the closure will be minimized.
- The use of incentive/disincentive payments to encourage for early completion.

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Lane Closures
March 23, 2012
Page 2 of 2

Our Regional Operations Director, Hari Sripathi, will be coming out with additional guidance on maintenance of traffic and District wide limitations on lane closure time frames. Success here will help us in avoiding the additional rework necessary when we have to recover from a bad traffic situation. Please distribute this memorandum throughout your work units. Thank you for your help in refreshing and reemphasizing this fundamental of our business with our employees and contractors.

Assistant District Administrators keep Public Affairs and the District Administrator aware of high visibility closings. All supervisors keep a copy of this memorandum in your desktop procedures/turnover folder.


Garrett Moore, P.E.
NOVA District Administrator

66 Express Lanes

Exhibit C

Draft Technical Requirements

Attachment 1.11

Construction Emergency Operations Communications
Plan



Construction Emergency Operations Communications Plan

4975 Alliance Drive
Fairfax, VA

Date Issued: _____

Table of Contents

1. Overview	- 3 -
2. Incident Definition.....	- 3 -
3. Incident Management Team.....	- 4 -
4. Notification Process.....	- 5 -
5. Holiday and Inclement Weather Events	- 6 -
Table 1: Program Staff Contact Information.....	- 7 -
Table 2: Incident Management Team Contact Information	8
Exhibit 1: Construction Emergency Operations Communications Plan Flow Diagram	9

Attachments

Acknowledgement of Receipt

66 Express Lanes – Contract Incident Flow Chart

Incident Management Team Information Card

Contractors Contact Information

Inspector's Emergency Contact Information Card

1. Overview

This *Construction Emergency Operations Communications Plan* outlines the notification protocol to be followed in the event of a major incident occurring within the Virginia 66 *Express Lanes* (the Program) limits, to ensure that all appropriate Program and agency personnel are notified of the incident. This Plan also provides the Program's definition of major incidents that require a timely and coordinated response by Program personnel to address any Program-related issues. The Plan also identifies the appropriate Task Managers to be notified and provides contact information for each team member on the Incident Management Team.

2. Incident Definition

The 66 *Express Lanes* definition of a major incident is: ***An incident within an active work zone that may endanger the safety of traveling motorists and/or Virginia 66 Express Lanes' and contractor's staff.*** The following are examples of the incidents that fall under this definition:

- Traffic accident resulting in property damage to any devices or structures installed by any 66 Express Lanes contractors.
- Traffic accident resulting in a fatality.
- Any incident resulting from inclement weather, such as flooding or heavy snow.
- Any lane closure unable to be demobilized before the required time limit per the contract requirement.
- Any incident involving a contractor's equipment that causes property damage or injuries to workers or the public.
- Traffic accident resulting in a hazard material spill that will cause environmental concerns.
- Unsafe work operations that present potential imminent danger.
- Any incident occurring within the project limits that may result in any public scrutiny.

3. Incident Management Team

The **Incident Management Team** is responsible for notifying individuals within their respective agencies which is determined based on the level of crisis of the incident. The team shall take the following actions:

- 1) Assess the situation either in person or by conference call, with the individuals listed in Table 1: Program Staff Contact Information.
- 2) Identify and prioritize key audiences, coordinate and implement incident response or verbal response as appropriate. Identify a plan for effectively communicating the “who, what, where, when and what we’re doing about it” to designated key audiences. The priority ranking of the project’s various constituents may shift depending on the incident’s nature and severity, as will the methods of reaching the key audiences. Information is disseminated to key audiences in order of the greatest need to know. Key audiences include:
 - Transportation Operations Center (TOC)
 - Construction Contractor
 - Local authorities/emergency responders (medical, fire, law)
 - News media
 - Local, state, and federal elected and appointed officials
 - Neighbors and community leaders
 - General public and motorists in the metropolitan area

Incident Management Team members have responsibilities specific to their disciplines. After initial activities and contacts are complete, team members engage in incident recovery as it relates to their job duties.

- 3) Contact designated individuals and agencies as appropriate. Table 2: Incident Management Team Contact Information is provided for this purpose. The degree and timing of notification should be determined and could range from an immediate contact to a subsequent wrap-up contact.

The Incident Management Team consists of the following Program Staff:

- VDOT Regional Transportation Program Director – Susan Shaw
- GEC Program Manager – *TBD*
- GEC Incident Manager – *TBD*
- VDOT Regional Transportation Program Communications Director – Hari Sripathi
- VDOT PIO Manager – Michelle Holland
- GEC 66 Express Lanes PIO Manager - *TBD*
- GEC 66 Express Lanes Safety & Health Manager - *TBD*
- VDOT 66 Express Lanes – Project Manager – *TBD*
- GEC I 66 Express Lanes – Construction Manager – *TBD*
- VDOT Transportation Operations Manager - Jim Turner
- VDOT PSTOC Operations Manager – Candice Gibson

4. Notification Process

When an incident occurs, Program personnel must follow the notification process shown in Exhibit 1: Construction Emergency Operations Communications Plan Flow Diagram to ensure that all appropriate project personnel are notified:

- a) The field staff will be the first line of defense in the event of an incident. Field staff members should report the incident to members of the Virginia 66 Express Lanes Management team who will:
- Assess the severity of the incident using the “severity test.” A severe incident includes:
 - Incident that creates a dangerous condition;
 - Crash involving hazardous materials;
 - Personal injury requiring evacuation via ambulance.
 - Full closure of interstate or major roadway for more than 1 hour.
 - Significant damage to work, material (including spill) or equipment
 - Take needed immediate action (unless completed by reporting person) such as:
Call 911; Contact contractor on site;
 - Mitigate/control the incident.
 - Determine who is contacted next, based on severity.
If severe, contact the **Incident Manager**;
Otherwise send an incident report to the **Safety Health Manager** before the close of the next business day.
 - Complete an Incident Report and deliver to the **Safety Health Manager**.
- b) The **Incident Manager**, when contacted, shall do the following:
- Call the NRO TOC
 - Contacts team members as appropriate.
 - Determines whether the **Incident Management Team** needs to be:
 - Briefed only
 - Communicated with via conference call or Incident Management Team conference call:
 - Phone Number: **TBD**
 - Incident Manager (Host) Access Code: **TBD**
 - Incident Management Team Access Code: **TBD**
 - Meet in person

The Incident Manager or his designee will provide email updates to the Incident Management Team as to the status of the incident.

The **Incident Manager** will conduct a debriefing if necessary with **the Incident Management Team, contractor’s management staff and include the TOC Manager or designee**, following the incident to discuss lessons learned. Key individuals directly involved with the project who have not yet been informed of the incident should be notified for the debriefing.

Documentation should be continued through the debriefing. The Incident Manager ensures that the incident is documented, including how it was resolved and the ultimate outcome. Documentation can take the form of an email/memo or Incident Report Form. No field staff will communicate with the media unless authorized by the VDOT or GEC PIO Manager.

5. Holiday and Inclement Weather Events

During extended holidays and anticipated inclement weather events, Program Management team members and individual Task Managers will identify an on-call staff member. This person must be available to respond to any inquiries or complaints received that require a response. When an inclement weather event is anticipated, the Incident Manager will conduct a coordination meeting with VDOT area offices, VDOT TOC, and I-66 Program contractors to develop an action plan in preparedness for the inclement weather.

Contact information for VDOT's area offices and NRO TOC personnel who will need to be part of the coordination efforts is presented below:

Interstate Administration

703-366-1961/ FAX 703-335-2208

Interstate 495 Area Headquarters

703-313-8066 (Main Number)
Gayla Hill 571-220-5322 (Cell)

Interstate 395 & 95 Area Headquarters

703- 494-7575 (Main Number)
Doug Holsapple 703- 749-8050 (Cell) 571-722-5322

Van Dorn Area Headquarters

703-921-5091 (Main Number)
Tommy Selvage 703- 921-5093(Office) / 571- 749-8050 or 301-873-9183 (Cell)
Gary Carpenter 703-921-5091 (Office) /703-296-2141 (Cell)

Newington Area 7 Headquarters

703-339-1444 (Main Number)
Howard Akers 703- 339-1444 (Office) / 571- 749-8061 (Cell)
Shane White 703-346-0941 (Office) / 703-656-1520 (Cell)

Table 1: Program Staff Contact Information

Contract	VDOT Project Staff	GEC Project Staff	Contractor
66 Program	TBD	TBD	TBD

Table 2: Incident Management Team Contact Information (*Example Flow Chart, Construction Emergency Communications Plan, would be updated prior to NTP with project specific information*)

Construction Emergency Communications Plan

July 2014

<p>INCIDENT MANAGEMENT Paul Anderson (o) 703-691-6728 (c) 240-401-1758</p> <p>NOVA Transportation Operations Center (TOC) (o) 703-877-3450</p> <p>Candice Gibson (o) 571-350-2072 (c) 571-221-6099</p> <p>Virginia State Police Emergency #77 or 1-800-572-4510 Non-Emergency 703-803-0026</p> <p>Division Seven HQ (FFX & PW Counties) (o) 703-803-2660</p> <p>Area 11 Office I-95 PW Co (o) 703-791-3101</p> <p>Area 45 Office I-395 (o) 703-845-6300</p> <p>Area 48 Office I-95 FFX Co (o) 703-323-2671</p> <p>Division Two HQ (Stafford County) (o) 540-829-7401</p> <p>Area 5 Office I-95 Stafford Co (o) 540-891-4108</p> <p>Fairfax County Police & Fire (o) 703-691-2131</p> <p>Prince William County Police & Fire (o) 703-792-6500</p> <p>Stafford County Sheriff & Fire (o) 540-658-4400</p>	<p>COMMUNICATIONS AND MEDIA Michelle Holland (o) 703-259-3378 (c) 703-586-0487</p> <p>Joan Morris, VDOT (o) 703-259-1799 (c) 571-238-5030</p> <p>Jennie McCord, VDOT (o) 703-259-1779 (c) 571-230-2926</p> <p>WTOP 202-895-5060 newsroom@wtop.com</p> <p>Ari Aske (o) 202-895-5060 (c) 202-630-4601 aashe@wtop.com Twitter: @ariaske</p> <p>Dave Dildine ddildine@wtop.com</p> <p>Reada Kessler - Traffic (o) 301-509-4702 rkessler@wtop.com</p> <p>Bob Marbourg (o) 202-438-1367 bmarbourg@wtop.com</p> <p>Clear Channel 301-628-2600 301-562-7190 Weekends - 301-628-2625 operations@totaltraffic.com</p> <p>Danielle Deverell (o) 240-747-2870 danielle@totaltraffic.com ronbalcarek@clearchannel.com</p> <p>WAMU 202-885-1233 news@wamu.org</p> <p>ABC 7/8-WJLA 703-236-9555 newsdesk@wjla.com</p> <p>NBC 4-WRC 202-885-4111 news4pr@nbcuni.com news4desk@nbcuni.com</p> <p>CBS-WUSA 9 202-895-5700 wusa-assignmentdesk@wusa9.com</p> <p>Fox 5-WTTG 202-895-3000 wttg.desk@foxtv.com</p> <p>Wash. Post Breaking News 202-334-7300 postnow@washpost.com</p> <p>Bob Thomson, Dr. Gridlock (o) 202-334-5210 (c) 202-560-3431</p>	<p>PROJECT MANAGEMENT H S "Charlie" Warraich VDOT (o) 703-691-6740 (c) 571-237-8229</p> <p>Susan Shaw, VDOT (o) 703-259-1995 (c) 571-221-5219</p> <p>John Morse (o) 703-691-6732 (c) 703-269-8166</p> <p>Mike Snare (o) 703-691-6741 (c) 571-329-2143</p> <p>John DePasquale (o) 703-430-7500 Ext. 139 (c) 571-238-6189</p>	<p>VDOT SENIOR LEADERSHIP Susan Shaw (o) 703-259-1995 (c) 571-221-5219</p> <p>Helen Cuervo (o) 703-259-2345 (c) 571-238-2520</p> <p>Renee Hamilton (o) 703-259-2747 (c) 703-975-0768</p> <p>Hari Sripathi (o) 703-259-2223 (c) 571-221-3729</p> <p>Branco Vlacich (o) 703-259-2223 (c) 571-749-7884</p> <p>Tarsem Lal (o) 804-775-3345</p> <p>Garrett Moore (o) 804-786-2713 (c) 571-455-6383</p> <p>Charlie Kilpatrick (o) 804-786-2701 (c) 804-840-2713</p>	<p>SENIOR SAFETY MANAGER David Law (c) 703-200-1733</p> <p>VA Occupational Safety & Health (o) 703-392-0900 After 5 PM: 571-264-4089</p> <p>OSHA 757-441-3820 Emergency: 1-800-321-6742</p> <p>VDOT Safety & Health 804-371-6859</p> <p>VDOT Safety Paul Matticks (o) 804-371-6859 (c) 703-975-5027</p> <p>Fairfax County Health Dept. 703-246-2411</p> <p>Prince William Health Dept. 703-792-7300</p> <p>Stafford County Health Dept. 540-659-3101</p> <p>Maryland Health Dept. Emergency Response 410-767-0823</p>	<p>ENVIRONMENTAL MANAGER John Morse (o) 703-691-6732 (c) 703-269-8166</p> <p>VDOT Hazmat Manager Brutus Cooper (o) 703-259-2985 (c) 540-220-2403</p> <p>Fairfax County Fire 703-691-2131 / 911</p> <p>Prince William County Fire 703-792-6500 / 911</p> <p>Stafford County Fire 703-658-4400 / 911</p> <p>VDEM - Emergency Operations Center 800-468-8892 or 804-674-2400</p> <p>VDEM HazMat Officer Area 1 Craig Buckley (c) 804-332-3463</p> <p>VDOT District Environmental Manager John Muse (o) 703-259-1215 (c) 571-641-1176</p> <p>VDEQ (Hazardous Spills) 800-468-8892</p> <p>VDEQ NO Va Prep. Coordinator Mark Miller (o) 703-583-3864 (c) 804-396-0150</p> <p>USCG National Spill Response Center (o) 800-424-8802</p> <p>MD Dept of Environmental Emergency Response (o) 866-633-4686</p>
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Sample Only

Virginia Department of Transportation
 Northern Virginia District Office
 4975 Alliance Drive Fairfax, VA 22030



Exhibit 1: Construction Emergency Communications Plan Flow Diagram Operations *(The Department and Developer will develop Construction Emergency Communications Plan prior to NTP with project specific information)*

Mission of Incident Management Team

- Immediate communication of an incident to appropriate project leadership, sponsoring agency and field personnel.
- Activation of existing incident management and safety/environmental systems within state agencies.
- Formulation and execution of a public message

Steps for Responding to an Incident

1. All incidents should be reported to 911 first and then the Incident Manager who will take the needed immediate action. A Medical Injury should be reported to the Safety Manager. He will determine severity, make initial contact with Construction Management based on severity and take the appropriate action.

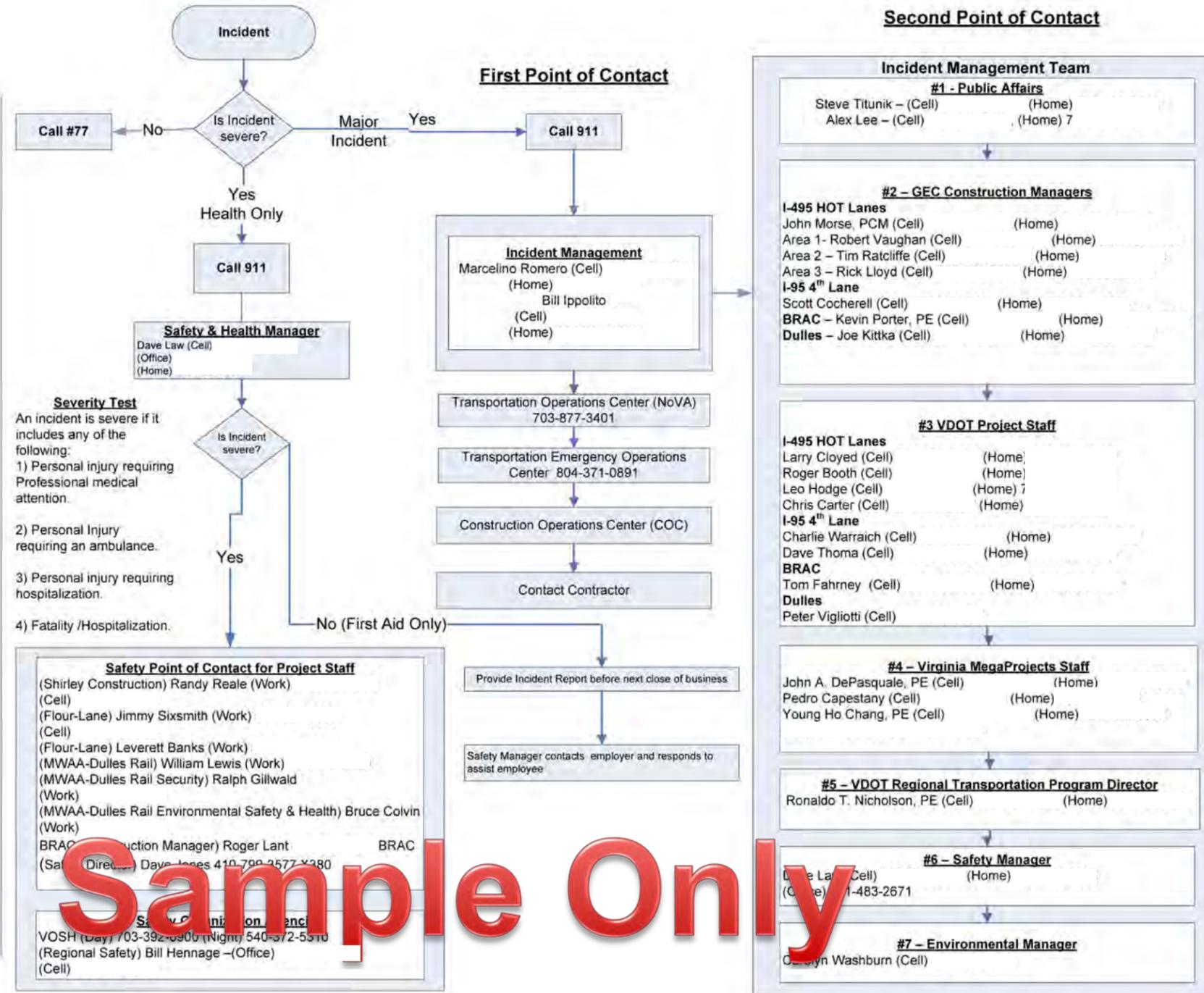
2) The Incident Manager determines whether team needs to be briefed only, communicate by conference call, or meet in person. Also, he contacts team members as appropriate.

- Incident Management Team Conference Call:**
- Phone Number: 888-273-3658
 - Host Access Code: 1270602
 - Team Access Code: 2850

3) The Incident Management Team will identify and prioritize key audiences and coordinate and implement appropriate incident response and verbal response.

4) The Incident Management Team members contact designated individuals and agencies as appropriate (see Table 2).

5) The Incident Manager will conduct a debrief following an incident.



Attachments

Attachment 1:

Acknowledgement of Receipt

I, _____ have received a copy of the Virginia 66 Express Lanes *Construction Emergency Operations Communications Plan*.

Employee Name (Please print)

Date

Employee Signature

Date

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.1a

Long-Range Transportation Planning

Improvements

Long-Range Transportation Planning Improvements

Projects funded for construction in the *National Capital Region's 2015 Constrained Long Range Plan (CLRP) Amendment* (October 21, 2015) through 2025 and 2040 have been assumed as background transportation projects for 2025 and 2040 Build/No-Build scenarios, respectively.

Table 1: Corridor-Specific Background Transportation Projects

(Projects marked with '' directly impact or are impacted by I-66 Project improvements)*

Location	Project
US 15/I-66 Interchange Reconstruction* (CLRP 3014)	Construction of a diverging-diamond interchange (DDI)
US 15 Widening Project	Widening to four lanes between I-66 and US 29 (Gainesville)
US 29/Linton Hall Road Interchange Improvements* (CLRP 1956)	Construction of a single point urban interchange (SPUI) at Linton Hall Road and US 29 (Gainesville); overpass over Norfolk Southern Railroad; widening US 29 (Gainesville) to six lanes; eliminating driveway access and two signals in the vicinity
I-66 Widening between Gainesville and Haymarket* (CLRP 1752)	Widening to eight lanes (one HOV and three general purpose lanes in each direction) between US 15 in Haymarket and US 29 in Gainesville
Route 234 Bypass Extension (Bi-County Parkway)* (CLRP 1865)	Construction of new four-lane roadway between I-66 and US 50
Route 234 Bypass/Relocated Balls Ford Road Interchange* (CLRP 3177)	Replacement of existing at-grade intersection with a grade-separated interchange at the re-aligned Balls Ford Road
Manassas Battlefield Bypass (CLRP 3061)	Closing of US 29 and Route 234 through Manassas Battlefield; construction of new four-lane roadway to the north
University Boulevard/Progress Court Extension	Construction of new four-lane roadway between Sudley Manor Drive and Wellington Road/Progress Court
Rollins Ford Road Extension (CLRP 3293)	Construction of new four-lane roadways between Linton Hall Road and Wellington Road
Route 620* (New Braddock Road)	Widening and construction of new four-lane roadway between Route 28 and US 29 (Centreville)/Route 662 (Stone Road) including crossing over I-66. Fairfax County refers to project as Stone Road Overpass.
Route 28 Corridor Improvements* (CLRP 1734, 3264, 1734 Amendment pending)	Widening to eight lanes between I-66 and Route 7; remove three traffic signals along Route 28 at Ellanor C. Lawrence (ECL) Park, Braddock Road/Walney Road, and southbound Route 28 to I-66 eastbound ramp; reconfiguration of Route 28 and I-66 interchange to not-to-preclude improvements along I-66; HOV and widening
Fairfax County Parkway (Route 286) Improvements* (CLRP 2106)	i) Widening from four to six lanes between US 29 and Route 123 ii) Widening from six to eight lanes with the additional lane serving as HOV lane in each direction during peak periods between Dulles Toll Road and I-66

Table 1 Note: see also CLRP at Metropolitan Washington Council of Governments (MWCOC) - <http://www.mwcog.org/clrp/>

Table 2: Other Regionally Significant Transportation Projects that may impact, or be impacted by, traffic on I-66

Location	Project
Shirley Gate Road (Route 655) Extension (pending CLRP)	Construction of new four-lane roadway between Braddock Road and Fairfax County Parkway
Dulles Corridor Metrorail Silver Line between East Falls Church and Route 772 in Loudoun County (CLRP/TIP)	i) Construction of Phase 1 of Silver Line (11.7 miles) between East Falls Church, through Tysons Corner and Reston, and Wiehle-Reston East ii) Construction of Phase 2 of Silver Line (11 miles) that extends from Wiehle-Reston East, through Dulles International Airport, to Route 772 (Ryan Road) in Loudoun County

Table 2 Note: Fairfax County has additional detail on priority transportation projects in the county at the following link – http://www.fairfaxcounty.gov/fcdot/6yr_priorities.htm

Table 3: Other Corridor Related Long Range Planned Transportation Projects (referenced in local jurisdictional plans)

Location	Planned Project
US 15	Planned for 4 lanes between US 29 (Lee Highway) and Loudoun County
US 29 (Lee Highway)	Planned for 6 lanes between US 15 and Route 234
Catharpin Road	Planned for 4 lanes between Route 55 and Heathcote Boulevard
Heathcote Boulevard	Planned for 4 lanes between US 15 and US 29
University Boulevard	Planned for 4 lanes from US 29 to south of Wellington Road
Route 50 (Lee Jackson Memorial Highway)	Planned for 8 lanes between I-66 and Waples Mill Road at future interchange of Route 50 and Waples Mill Road
Waples Mill Road	Planned for 4 lanes between I-66 and Route 50
Sutton Road	Planned for improved 2 lane road between Blake Lane and Route 123 (Chain Bridge Road)
Cedar Lane	Planned for improved 2 lanes between Route 50 (Arlington Boulevard) and Gallows Road
Gallows Road	Planned for 6 lanes between I-66 and Route 7 in Tysons
Prosperity Avenue	Planned for improved 4 lanes between Route 29 and Gallows Road
Route 7 (Leesburg Pike)	Planned for 6 lanes between Haycock Road and Magarity Road

Table 3 Sources:

Prince William County Transportation Plan – http://eservice.pwcgov.org/planning/documents/19_Transportation.pdf

Fairfax County Transportation Plan Map- http://www.fairfaxcounty.gov/maps/images/maps/handouts/pdf/transportation_plan_map.pdf

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.1b

Summary of Design Exceptions and Waivers

Summary of Design Exceptions and Waivers I-66 Corridor Improvements (Outside the Beltway) PHASE 1

Updated DATE: 09-12-2016

To Be Obtained By	DE or DW	No.	Item	Location	Design Feature	Proposed Design	Min AASHTO (for DE) and VDOT (for DW) Standards Required	Remarks	Design Exception/Design Waiver Preliminary Justification (based on RFP Concept Plans)
VDOT	DE	1	No shoulder width on left of GP lanes, right of Express lanes due to 4' Buffer with Pylons	Entire Corridor	Shoulder Width	No Shoulder	Full shoulders and barrier separation	4' buffer with pylons to separate General Purpose Lanes from Express Lanes	Additional 22ft pavement widening in each direction requires reconstruction of all existing interchanges, bridges, adjacent structures, and realignment of local streets, resulting in larger project footprint and right-of-way impact. Major impact to the existing creeks, park, school and residential/commercial properties. The two metro stations at Dunn Loring and Vienna would be impacted.
Developer	DE	2	Express Lane and GP Lane Shoulder Width Reduction due to Sign, Lighting, Traffic Management System (TMS), Toll Structures, Bridge Piers and Misc.	Entire Corridor	Shoulder Width	Varies (6' to 8')	10 ft. Paved Shoulder	This design exception is for the localized reduction in shoulder width due to barrier blisters to accommodate sign, lighting, TMS, toll structures, retaining walls and bridge piers. Stopping Sight Distance (SSD) will need evaluated to determine if a separate design exception is required as well. Where the design meets AASHTO but still does not meet the VDOT requirement a DW will be required.	Relocate existing structures. Also, includes, but not limited to, the replacement of existing bridges; realignment of EB/WB GP lanes and associated ramps; relocation of roadside structures and retaining walls; right-of-way acquisition; larger project footprint; impact on drainage system.
Developer	DE	3	General Purpose Lanes Outside Shoulder Reduced Width	Vienna Metro Station	Shoulder Width	Varies (8' to 11')	10 ft. Paved Shoulder	Reduced EB GP Outside Shoulder Width. Reduced shoulder width to avoid impacting the existing Vienna Metro station facilities. Where the design meets AASHTO but still does not meet the VDOT requirement a DW will be required.	Relocate newly constructed Vienna metro facilities including ped bridge, bus-bay facilities, parking lot - with disruption to Metro operations; additional widening of proposed bridges, additional right-of-way acquisition; larger project footprint; impact on drainage system.
Developer	DE	4	Design Speed	Braddock/Walney Road	Design Speed	35 mph	40 mph	Horizontal and Vertical profiles on Braddock/Walney road are designed to posted speed(35mph) and not to the design speed (40mph). The curves were designed to maintain the existing alignment and to not impact park property. This includes SSD designed to 35 mph.	Meeting the 40 mph design requirements horizontally would require property from E.C. Lawrence Park.
Developer	DE	5	Vertical Profile (Crest Curves)	Route 28	Vertical Alignment (K Value)	K value meets 50 mph Design Speed	K value should meet 60 mph Design speed	Route 28 has a K value that meets 50 MPH not 60 MPH. This is at a spot that the current design speed is 50 MPH due to the traffic lights further south in Centreville. The ramp can't attain the 60 MPH K Value without impacts further South on 28 Northbound	Additional impacts to Route 28 including impacts to the US 29 interchange and the intersections further south.
				Route 28	Vertical Alignment (K Value)	K value meets 50 mph Design Speed	K value should meet 60 mph Design speed	Route 28 has a K value that meets 50 MPH not 60 MPH. This is at a spot that the current design speed is 50 MPH due to the traffic lights further south in Centreville. The ramp can't attain the 60 MPH K Value without impacts further South on 28 Northbound	Additional impacts to Route 28 including impacts to the US 29 interchange and the intersections further south.
Developer	DE	6	Reduced Express Lane Inside Shoulder Widths	Between Blake Overpass and Nutley Overpass	Shoulder Width	Shoulder Width Varies (4' Min.) on the Left	10 ft. Paved Shoulder	Reduced shoulder width to avoid impacting the existing Vienna Metro station facilities. Where the design meets AASHTO but still does not meet the VDOT requirement a DW will be required.	Relocate newly constructed Vienna metro facilities including ped bridge, bus-bay facilities, parking lot - with disruption to Metro operations; additional widening of proposed bridges, additional right-of-way acquisition; larger project footprint; impact on drainage system.
Developer	DE	7	Substandard shoulder Cross Slopes on I-66 Express Lanes	RTE. 50 to RTE. 495	Substandard shoulder Cross Slopes	>6%	AASHTO (6% max.) VDOT (GS-5)	The Design Exception is required due to proposed pavement build-up (4.5") that would force steeper slopes on the inside shoulder on I-66 express lanes in order to maintain existing barrier along the WMATA tracks. There is a previously approved DE for substandard shoulder cross slopes from Prior completed project (I-66 Pavement Rehabilitation from RTE. 50 to I-495)	Reset the existing barrier along the track on both sides that would require extensive coordination with WMATA and could have potential disruption to Metro's daily operations.
Developer	DE	8	Principal Arterials Road Reduced Shoulder Width	Route 28	Shoulder Width	Varies 6'-12' Outside Shoulder	10 ft. Paved Shoulder	Lanes on Route 28 North of the interchange reduce to 11' with a 6'-12' shoulder in order to avoid the park property. This design exception is required in order to prevent right of way takes on the park. This was presented as the avoidance option. Where the design meets AASHTO but still does not meet the VDOT requirement a DW will be required.	Take property from EC Lawrence Park
VDOT	DE	9	Existing Vertical Clearance Roadway (PHASE 1 Req'd)	Rte. 29 Centreville (B682, B683)	Vertical Clearance	Maintain Existing Clearance (B682 15'-0", B683 14'-7")	VDOT 16'-6" AASHTO 16'-0"	The superstructure of the bridges are fairly new and are reasonable to be reused rather than replaced. The existing vertical clearances are 15'-0" and 14'-7" as per the inspection reports. Design Exception is required for Reduce Shoulder Width	Bridges to be replaced for Preferred Alternative. Increase the clearance to 16'-6" (VDOT standard) by REPLACE and reconstruction of approaching roadway in phases.
				Rte. 234 Business (B626, B622)		Maintain Existing Clearance (B622 14'-7", B626 14'-7")	VDOT 16'-6" AASHTO 16'-0"	The superstructure of the bridges are fairly new and are reasonable to be reused rather than replaced. The existing vertical clearances are 14'-7" as per the inspection reports. Design Exception is required for Reduce Shoulder Width	Bridges to be replaced for Preferred Alternative. Increase the clearance to 16'-6" (VDOT standard) by REPLACE and reconstruction of approaching roadway in phases.
VDOT	DE	10	General Purpose Lanes Outside Shoulder Reduced Width (BRIDGE)	Rte. 29 Centreville (B682, B683)	Shoulder Width	Shoulder Width Varies (2' Min)	10 ft Paved Shoulder	The superstructure of the bridges are in reasonable condition to be reused rather than replaced.	Bridges to be replaced for Preferred Alternative, per VDOT standard by REPLACE and reconstruction of approaching roadway in phases.
				Rte. 234 Business (B626)				The superstructure of the bridges is in reasonable condition to be reused rather than replaced.	Bridges to be replaced for Preferred Alternative, per VDOT standard by REPLACE and reconstruction of approaching roadway in phases.

Summary of Design Exceptions and Waivers I-66 Corridor Improvements (Outside the Beltway) PHASE 1

Updated DATE: 09-12-2016

To Be Obtained By	DE or DW	No.	Item	Location	Design Feature	Proposed Design	Min AASHTO (for DE) and VDOT (for DW) Standards Required	Remarks	Design Exception/Design Waiver Preliminary Justification (based on RFP Concept Plans)
Developer	DW	1	Vertical Clearance at Existing bridges to Remain	Blake Ln (EB)	Reduced Vertical Clearance	16'-2.5"	VDOT 16'-6" AASHTO 16'-0"	Reduced vertical clearance due to proposed pavement build-up (4.5"). Meets min. AASHTO Std. 16' vertical clearance. Existing Blake Ln bridge to remain.	Replace existing bridge to meet VDOT standard.
				Ramp - I495 Express NB to I-66 Express WB		16'-3.5"		Reduced vertical clearance due to proposed pavement build-up (4.5"). Meets min. AASHTO Std. 16' vertical clearance. Existing ramp bridge to remain.	This bridge was originally built in 1963, Lengthened in 1983, and rehabilitated in 2011/2012 as part of the I-495 Express lanes project. Replace existing bridge to meet VDOT standard.
				Stringfellow Road		16'		Reduced vertical clearance due to widening of I-66. Meets min. AASHTO Std. 16' vertical clearance. Potential 2nd DW will be needed since the span to depth ratio may not meet the minimum requirements specified in V5P2, chapter 11 and a DW may therefore need to be submitted.	Replace existing bridge to meet VDOT standard.
				Fairfax County Parkway		16'		Reduced vertical clearance due to widening of I-66. Meets min. AASHTO Std. 16' vertical clearance. Potential 2nd DW will be needed since the span to depth ratio may not meet the minimum requirements specified in V5P2, chapter 11 and a DW may therefore need to be submitted.	Replace existing bridge to meet VDOT standard.
				Compton Rd		15'-5"	VDOT 16'-6" AASHTO 14'-6"	Maintain same as existing 15'-5" vertical clearance due to widening of I-66. Meets min. AASHTO Std. 14'-6" vertical clearance. Potential 2 nd DW will be needed since the span to depth ratio may not meet the minimum requirements specified in V5P2, chapter 11 and a DW may therefore need to be submitted.	Replace existing bridge to meet VDOT standard.
Developer	DW	2	Trail along I-66	Corridor	Trail Width	8'	10'	Reduced trail width at various places to avoid additional right of way impacts, environmental feature, utility structure. The 8 FT Trail Path is proposed by Fairfax County DOT	Additional right of way would be required to meet the 10' minimum throughout the project corridor. The 10' trail has been maintained in all areas that don't require additional right of way for the trail.
VDOT	DW	3	Buffer Strip on Poplar Tree Road has been reduced to 5 feet	Poplar Tree	buffer width	5 ft Buffer	VDOT 8' Buffer	The buffer strip will be reduced to 5 ft in order to avoid taking right of way on the adjacent property. Also the VDOT required 3 ft clearance to a wall or fence will be reduced to 2 feet.	Right of way takes from FP-USG Chantilly LLC requiring the loss of tree buffer strip as well as parking. Parking losses could impact the lease that the property owner has with their tenants.
Developer	DW	4	Overtopping of Roadway	Bull Run/Cub Run	Profile	Match existing	Provide 18" freeboard	VDOT criteria requires the roadway elevation from the design year storm elevation to provide a minimum of 18" of freeboard to the lowest edge of the shoulder. This may not be obtainable during final design in the Bull Run/Cub Run vicinity and would require a design waiver if the design does not meet the requirement.	In order to meet the standard, the roadway elevation and profile would need to be raised and the bridge structure across Bull Run would require reconstruction instead of widening as shown in the RFP Conceptual Plans.
Developer	Access Management Waiver	1	Signalized Intersection Spacing for a Minor Arterial with a Posted Speed of 35-45 MPH	Stringfellow Road	Intersection Spacing	275'	1050'	This access management waiver only applies to the RFP Plan and not the Preferred Alternative. This phase builds one half of the Preferred Ramp and leaves the existing ramp in place, separating westbound and eastbound access to the express lanes. Both ramps will require signalized intersections.	Building the Preferred Alternative would eliminate the need for this waiver.

Additional DE/DW required for Preferred Alternative

Developer	DE	3	General Purpose Lanes Outside Shoulder Reduced Width	Sta. 5425+00 to Sta. 5449+00 (Westbound)	Shoulder Width	2'	10 ft. Paved Shoulder	This design exception is for the localized reduction in shoulder width due to close proximity to Manassas National Battlefield Park, Historic District Areas, Bull Run Regional Park and Izzak Walton Park. Avoidance Alternatives required by section 4(f).	Need additional 8' to 12' full depth paved shoulder and Right of Way acquisition for approximately 2 miles through National Park Service and Regional Park Service Authorities.
				Sta. 5413+00 to Sta. 5415+00 (Eastbound)		4'			
				Sta. 5550+00 to Sta. 5559+00 (Westbound)		Varies (2' to 12')			
				Sta. 5550+00 to Sta. 5561+00 (Eastbound)		Varies (6' to 12')			
				Sta. 5637+00 to Sta. 5659+00 (Eastbound)		Varies (6' to 12')			
Developer	Access Management Waiver	1	Signalized Intersection Spacing for a Minor Arterial with a Posted Speed of 35-45 MPH	Monument Drive	Intersection Spacing	670'	1050'	In order to preserve room for the metro, the design shifts the intersection to the north of the existing intersection. This shifts it closer to the Monument Drive/ Fair Lakes Parkway intersection.	Keep the intersection in the median which precludes metro.

Notes:

1. List of DE/DW identified is based on conceptual plans that are based on GIS information only – Additional DE/DW may be required as the design progress
2. This is a 'Work in Progress' document and is intended for information only.
3. Potential DE/DW

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.3

Settlement of Structures

Attachment 3.3 Settlement of Structures

Unless approved by the State Structure and Bridge Engineer, the Developer shall design all structures to meet the design requirements listed below:

1. Foundation settlements shall be investigated using all applicable loads in Service I Load Combination (AASHTO 7th Edition, Section 10.5.2.2).
2. As measured from the bottom of the bridge bearing, or top of pier cap, the settlement limits are defined as follows:
3. Total settlement (S_{TOT}) shall be defined as:

$$S_{TOT} = \text{Elastic Settlement} + \text{Consolidation Settlement} + \text{Secondary Settlement.}$$

Elastic Settlement includes both that for the soil/rock plus the elastic shortening of the deep foundation element and the pier column.

Management of settlement of structures shall follow one of the following two options:

OPTION I:

Limit total settlement to 0.5 inch and subsequently limit the need for a refined analysis of the superstructure and substructure.

OPTION II:

1. Total settlement of the substructure unit over its entire design life (S_{TOT}) shall be limited to 2 inches.
2. Total settlement to occur after completion of the bridge to the end of its design life (S_{POST}) shall be limited to 1 inch.
3. Plans shall incorporate the following “General Note” populated with the actual settlement values used in the design of the structure:

“This structure has been analyzed and designed to accommodate settlement as noted below: Total Settlement of (___)” has been accommodated. The total settlement (S_{TOT}) is defined as the arithmetic sum; S_{TOT} (___)” = Elastic Settlement (___)” + Consolidation Settlement (___)” + Secondary Settlement (___)”. In addition, Differential Settlement of (___) radians, as measured center to center between adjacent columns or footings, has been accommodated.”

4. During construction and after all settlements have occurred the bridge structure (consisting of the superstructure, substructure and associated elements in the load

- path) must meet all structural capacity requirements for all loading combinations requiring such analysis. In addition, the structure must meet all structural capacity requirements for all load combinations for the listed differential settlement (AASHTO LRFD 7th Edition Section 3.12.6).
5. The bearings and substructure shall be designed and detailed to accommodate increases or decreases in loads due to total or differential settlement shown on the plans. The superstructure shall be designed and detailed to accommodate changes in loads, locations of inflection points or fatigue stress ranges. (AASHTO LRFD 7th Edition Sections 3.1, 3.4.1, 3.12.6, 5.7.3.6.1).
 6. Creep and/or shrinkage may only be used to offset settlement effects when it occurs CONCURRENTLY with settlement, and the designer is responsible for determining time rate of settlement and creep. [For instance, if all settlement is elastic (instantaneous), creep cannot be used to offset loads imposed].
 7. Joint rotations and bearing rotations due to settlement shall be considered in addition to all tolerances for rotations due to live load (LL) effects or for constructability (AASHTO LRFD 5th Edition Section 5.7.3.6.1).
 8. Settlements which change super elevation shall not reduce super elevation below the minimum specified by AASHTO for the roadway design speed and roadway type, nor shall they negatively impact the performance of the deck or approach paving.
 9. Settlements which change profile grade shall not:
 - a. Increase spread of drainage beyond limits specified in AASHTO.
 - b. Change performance or maintainability of utilities.
 - c. Introduce a low or flat spot on the bridge or reduce the minimum grade specified in the roadway drainage manual.
 - d. Negatively impact rideability.
 10. Coordinate predicted/expected settlement of the approach embankments and bridge structure to comply with contract rideability requirements.
 11. The structure must be capable of carrying a future wearing surface equal to the magnitude of the total anticipated settlement placed uniformly from curb to curb and abutment to abutment. The total future wearing surface loads, inclusive of any additional loads needed to mitigate for anticipated settlement, shall not exceed 15 psf. All parapets and railings shall accommodate the additional layer of surfacing with no modification or reduction in crash test level after construction.
 12. Jacking and shimming shall not be allowed to correct differential settlement, unless approved by the Department.

13. Settlements shall be treated as a load condition with $\gamma_{SE} = 1.0$ for all AASHTO indicated groups. Load combinations which include settlement shall also be applied without settlement (AASHTO LRFD 7th Edition Section 3.4.1).
14. Differential settlement at a single substructure unit shall be limited to a vertical value which does not exceed a slope from the horizontal of 0.001 radians as measured center to center between adjacent columns or footings within the same substructure unit.
15. When differential settlement at a single substructure unit is anticipated, both the superstructure and substructure shall be analyzed and detailed to account for the changes resulting from differential deflection.
16. Under no condition shall settlement be used to justify use of simple span configurations instead of continuous span configurations.

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.5

Nutrient Credit Assignment Agreement

NUTRIENT CREDIT ASSIGNMENT AGREEMENT

INSTRUCTIONS

There are times when someone other than VDOT (e.g., Design Build contractor, locality, etc.) purchases nutrient credits to satisfy water quality requirements on projects involving VDOT owned or operated roadways/facilities (existing or future). The Assignment Agreement is to be used for the transfer of the ownership of such nutrient credits from the purchaser to VDOT. The Assignment Agreement is to be completed with the appropriate project specific information and a copy of the bill of sale between the Nutrient Credit Bank and the purchaser is to be attached as Exhibit A. The Chief Engineer's office has delegated signatory authority to the District Administrator or his designee.

A copy of the executed agreement is to be included with the BMP information submitted either 1) with the VPDES Construction Permit Termination form LD-445D (where VDOT is the permittee) or 2) when the project is completed and the roadway/facility is turned over to VDOT for maintenance and operation (when VDOT is not the permittee).

ASSIGNMENT AGREEMENT

This Assignment Agreement (this “Agreement”), dated as of the [____] day of [____], 201_, is between [_____] (“Assignor”) and the Virginia Department of Transportation, an agency of the Commonwealth of Virginia (“Assignee”).

RECITALS

WHEREAS, on [DATE] the Assignor purchased nonpoint source phosphorus from [GENERATOR/SELLER]; and

WHEREAS, Assignor purchased [__] pounds of phosphorus credits and retired [__] pounds of nitrogen credits associated with such phosphorus credits;

WHEREAS, such phosphorus credits were generated at [FACILITY NAME] located in [COUNTY/CITY], Virginia; and

WHEREAS, Assignor has received a Bill of Sale from [GENERATOR/SELLER] dated [_____] and evidencing the purchase and attached hereto as Exhibit A; and

WHEREAS, the purchase of such phosphorus credits is associated with [PROJECT/PERMIT]; and

WHEREAS, Assignor desires to assign its rights and obligations under the Bill of Sale to Assignee and Assignee desires to assume the same.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual covenants and agreements set forth below and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. **Recitals.** The foregoing recitals are hereby incorporated by reference herein and made a substantive part hereof.
2. **Assignment.** Assignor hereby transfers, assigns, and conveys to Assignee all of Assignor’s right, title and interest in the phosphorus credits and associated nitrogen credits that are the subject of the Bill of Sale attached hereto as Exhibit A.
3. **Assumption.** Assignee hereby accepts all of Assignor’s right, title and interest in the phosphorus credits and associated nitrogen credits that are the subject of the Bill of Sale attached hereto as Exhibit A.

4. Counterparts. This Agreement may be executed in counterparts (including by means of telecopied signature pages), any one of which need not contain the signatures of more than one party, but all such counterparts taken together shall constitute one and the same instrument.

5. Governing Law. All matters relating to the interpretation, construction, validity and enforcement of this Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia, including all matters of construction, validity and performance.

6. Severability. Whenever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement is held to be prohibited by or invalid under applicable law, such provision shall be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.

7. Amendment. Any provision of this Agreement may be amended or waived only in a writing signed by the Assignor and Assignee.

This space intentionally left blank

IN WITNESS WHEREOF, the Assignor and Assignee have caused their duly authorized representative to execute this Agreement as of the date first above written.

ASSIGNOR:

By: _____

Name: _____

Title: _____

ASSIGNEE:

VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

CBAY-VA LLC - MIDLAND

AFFIDAVIT OF PHOSPHORUS CREDIT SALE

CBAY-VA LLC, a Virginia limited liability company (the "Company"), hereby certifies the following:

1. Pursuant to that certain **Contract #43961** ("Contract") and **Purchase Order # 50100-0001125257** ("Purchase Order"), between the Company (as Seller) and **The Commonwealth of Virginia, Department of Transportation** ("Purchaser"), the Company, for the benefit of the Purchaser, agrees to sell **102.30** pounds of nonpoint source phosphorus Credits to Purchaser and retire the associated ratio of nonpoint source nitrogen Credits at the credit generating facility in the amount of **1,367.75** pounds of nitrogen Credits;

2. The Company and the Purchaser will close the transaction contemplated by the Agreement on September 1, 2015 (the "Closing Date") and, as of the date hereof, the Company shall reserve for Purchaser the phosphorus Credits.

WITNESS the following signature:

CBAY-VA LLC,
a Virginia limited liability company

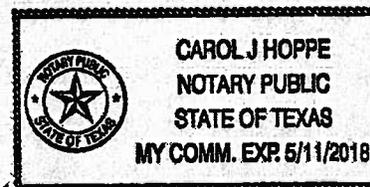
By: David Joyce
Manager

Date: September 1, 2015

Sworn to and subscribed before me this 1st day of September, 2015, by David Joyce, Manager, on behalf of CBAY-VA LLC, a Virginia limited liability company.

My commission expires: 5/11/18 State of Texas
County of Harris
Carol Hoppe
Notary Public

Permit #: **Pending**
Permittee: **The Commonwealth of Virginia, Department of Transportation**
Phosphorus Credits: **102.30 pounds**
Associated Nitrogen Credits: **1,367.75 pounds**
VDOT UPC#: **105500**
VDOT Project #: **Route 66; 0066-96A-297, P101**
District: **Fairfax County, Prince William County, Town of Vienna, Town of Fairfax, Town of Manassas -NOVA**



Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.6

Roadway Inventory and Major Design Criteria

I-66 Corridor Improvement - Roadway Inventory and Major Design Criteria

Roadway	Functional Classification	Geometric Design Standard	Design Speed (MPH)	Superelevation Standard	Terrain
I-66 Mainline General Purpose Lanes (From RTE.15 to RTE. 29 Centerville)	Urban Interstate (VDOT Urban Principal Arterial)	GS-5	70	TC-5.11R (8% Max.)	Rolling
I-66 Mainline General Purpose Lanes (From RTE. 29 Centerville to I-495)	Urban Interstate (VDOT Urban Principal Arterial)	GS-5	60	TC-5.11R (8% Max.)	
I-66 Express Lanes (Entire Corridor)	Urban Interstate (VDOT Urban Principal Arterial)	GS-5	70	TC-5.11R (8% Max.)	
US29 Lee Hwy (Gainesville)	Urban Other Principal Arterial	GS-5	60	TC-5.11R (8% Max.)	
VA840 University Blvd	Urban Major Collector	GS-7	50	TC-5.11U	
VA234 Prince William Pkwy	Other Freeway	GS-5	60	TC-5.11R (8% Max.)	
VA234 Sudley Rd	Urban Minor Arterial	GS-6	50	TC-5.11U	
US29 Lee Hwy (Centerville)	Urban Other Principal Arterial	GS-5	60	TC-5.11R (8% Max.)	
VA28 Sully Rd	Urban Other Principal Arterial	GS-5	60	TC-5.11R (8% Max.)	
Stringfellow Road	Urban Minor Arterial	GS-6	50	TC-5.11U	
Fairfax County Parkway	Other Freeway	GS-5	60	TC-5.11R (8% Max.)	Rolling
Monument Drive	Urban Minor Arterial	GS-6	40	TC-5.11U	
US Route 50 Lee Jackson Memorial Highway	Urban Other Principal Arterial	GS-5	60	TC-5.11U	
Waples Mill	Urban Minor Arterial	GS-6	40	TC-5.11U	
Jermantown Road	Urban Minor Arterial	GS-6	40 N of I-66 35 S of I-66	TC-5.11ULS	Rolling
Route 123	Urban Other Principal Arterial	GS-5	50	TC-5.11U	
Blake Lane	Urban Minor Arterial	GS-6	40	TC-5.11U	
Vaden Drive	Urban Major Collector	GS-7	30	TC-5.11ULS	
Nutley Street (DDI)	Urban Minor Arterial	GS-6	30	TC-5.11ULS	
Cedar Lane	Urban Minor Arterial	GS-6	35	TC-5.11U	
Gallows Road	Urban Minor Arterial	GS-6	40	TC-5.11U	
I-495	Urban Principal Arterial	GS-5	70	TC-5.11R (8% Max.)	

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.7

Minimum Pavement Sections

Attachment 3.7: Minimum Pavement Sections

The minimum pavement sections detailed herein shall be used for all construction, reconstruction or widening on this project except as permitted by Section 3.7.1 of the Technical Requirements. The Developer shall validate the adequacy of the minimum pavement sections and notify the Department of its findings prior to submitting the price proposal. If the Developer's findings require a deviation from the RFP requirements, the Developer shall notify the Department and submit the proposed revised pavement typical sections with supporting calculations for review at least 10 days prior to submission of the price proposal. Any proposed changes shall be included in the price proposal. Acceptable changes to the minimum pavement sections in the general purpose lanes are limited to increasing the specified thickness of the base or subbase layers. Any changes to the specified minimum pavement sections and/or location of the pavement sections shown on the RFP Conceptual Plans require approval by the Department. The Developer shall be responsible for the final design and construction of the pavements for this project in accordance with the Contract Documents.

The general intent of this project is to salvage the existing mainline pavement and full strength shoulders where they exist between the western limits of the project and Route 29 in Centreville by widening and building up the existing pavement. Between Route 29 in Centreville and the Capital Beltway, the intent is to remove the existing concrete and composite pavements to expose the existing subbase and/or stabilized subgrade layers. The Developer may elect to salvage the existing pavement beneath the future Express Lanes per the requirements of the attached typical sections. Alternatively, for Express Lane ramps and Mainline Express Lanes that will be maintained by the Developer, the Developer may elect to design an alternate pavement section. All alternate pavement sections shall be designed in accordance with the Technical Requirements listed in the Request for Proposals. Existing ramps that are to be widened as future Express Lane ramps shall meet the minimum requirements for standard WP-2 in addition to structural and lateral drainage requirements. Lateral drainage of the general purpose lane pavement subbase layers shall be facilitated by any alternate pavement designs for the Express Lanes. The native soils shall not be exposed where existing pavement layers are being salvaged. Any exposure of the existing subgrade soils (excluding cement stabilized subgrade) will require additional SWM treatment at the Developer's risk/expense. The Developer shall take particular care not to damage the existing cement stabilized base and/or cement stabilized subgrade during removal of the existing concrete pavements. Therefore, removal means and methods shall be limited to non-impact/non-vibratory means such as saw-cutting and lifting of existing slabs.

Any pavement sections requiring replacement or reconstruction outside of those listed above shall be designed in accordance with the 1993 AASHTO Guide for the Design of Pavement Structures (1993 edition) as modified by VDOT Materials Division's Manual of Instructions and submitted to VDOT for review. All interstate mainline pavements shall be constructed/reconstructed with full strength paved shoulders.

All widening of the existing pavements shall be accomplished in accordance with Standard WP-2 so that the proposed widening pavement layers match the existing pavement layers in types and thicknesses) prior to building up and/or placing the surface course except as noted in Tables 3.7.1 and 3.7.2 below. All existing pavement shall be saw-cut to a smooth vertical face a minimum of one foot inside the existing edge of full strength pavement in all widening areas.

Widening of existing pavement shall provide for lateral drainage of the existing pavement layers by providing a free-draining aggregate (such as 21B) on the low side of the pavement cross-slope connected to a standard UD-4 edgedrain placed beneath the outside edge of the paved shoulder. All OGDL shall be connected to a standard UD-4 edgedrain on the low side of the pavement cross slope. An impervious base/subbase (such as CTA) shall be provided for widening on the high side of existing pavement cross-slopes. The following note shall be added to the construction plans: The VDOT District Materials Engineer shall be notified as soon as the pavement saw-cuts are complete but no less than 48 hours prior to subbase/base placement in the widening areas.” All existing pavement shall be milled to a depth of 2” and resurfaced up to the nearest longitudinal lane divide wherever pavement markings will be eradicated or snow plowable raised pavement markers are removed.

Table 3.7.1 – Mainline I-66, EB and WB

Roadway	Limits ¹	Build-Up	Widening
I-66, EB & WB	Fr.: 1.18 Miles W. of Route 15 To: 0.02 Miles E. of Catharpin Road	Mill 2” 1.5” SMA-9.5 (76-22) ³ 2” IM-19.0D (Min. grade increase = 1.5”)	1.5” SMA-9.5 (76-22) ³ 2” IM-19.0D 12.5” BM-25.0D+0.4 10” 21B ^{5,6}
I-66, EB & WB	Fr.: 0.02 Miles E. of Catharpin Road To: 0.16 Miles E. of Business Route 234	Mill 1.5” 1.5” SMA-9.5 (76-22) ³	1.5” SMA-9.5 (76-22) ³ 2” IM-19.0D 14” BM-25.0D+0.4 10” 21B ^{5,6}
I-66, EB & WB	Fr.: 0.16 Miles E. of Business Route 234 To: 1.75 Miles E. of Business Route 234	Mill 2” 1.5” SMA-9.5 (76-22) ³ 3” IM-19.0D (Min. grade increase = 2.5”)	1.5” SMA-9.5 (76-22) ³ 3” IM-19.0D 11.5” BM-25.0D+0.4 14” 21B ^{5,6}
I-66, EB & WB	Fr.: 1.75 Miles E. of Business Route 234 To: 0.48 Miles E. of Route 29	Mill 2” 1.5” SMA-9.5 (76-22) ³ 3” IM-19.0D (Min. grade increase = 2.5”)	1.5” SMA-9.5 (76-22) ³ 3” IM-19.0D 12.5” BM-25.0D+0.4 14” 21B ^{5,6}
I-66, EB & WB	Fr.: To: 0.48 Miles E. of Route 29 To: Route 50	Remove ² Ex. 11” PCC and 3” OGDL to expose CTA 1.5” SMA-9.5 (76-22) ³ 2” SMA-12.5 (76-22) 13.5” BM-25.0D+0.4 3” OGDL ⁵ (grade increase = 6”)	1.5” SMA-9.5 (76-22) ³ 2” SMA-12.5 (76-22) 13.5” BM-25.0D+0.4 ¹¹ 3” OGDL ⁵ 6” CTA ⁴ 6” soil cement ⁸
I-66, EB & WB	Fr.: Route 50 To: I-495 (outside the limits of the existing Nutley Street Interchange C-D Road)	Remove ² Ex. 4” AC, 9”-11” PCC and 3” OGDL/5” 21A to expose soil cement or CTA 1.5” SMA-9.5 (76-22) ³ 2” SMA-12.5 (76-22) 16” BM-25.0D+0.4 3” OGDL ⁵ (grade increase = 4.5”)	1.5” SMA-9.5 (76-22) ³ 2” SMA-12.5 (76-22) 16” BM-25.0D+0.4 ¹¹ 1” 21B 12” #2/#3 aggregate ¹² wrapped in needle punch non-woven geotextile fabric
I-66, EB & WB	Fr.: Route 50 To: I-495 (within the limits of the existing Nutley Street Interchange C-D Road)	Remove ² Ex. 4”-21” AC, 9”-11” PCC and 5” 21A to expose soil cement or 21A aggregate 1.5” SMA-9.5 (76-22) ³ 2” SMA-12.5 (76-22) 16.5” BM-25.0D+0.4 3” OGDL ⁵ (grade increase = 5”)	1.5” SMA-9.5 (76-22) ³ 2” SMA-12.5 (76-22) 16.5” BM-25.0D+0.4 ¹¹ 0.5” 21B 12” #2/#3 aggregate ¹² wrapped in needle punch non-woven geotextile fabric
I-66 WB, E. of I-495 (Widening)	Fr.: Eastern limits of project To: I-495	Mill 1.5” 1.5” SMA-9.5 (76-22) ³	1.5” SMA-9.5 (76-22) ³ 2” IM-19.0D 12.5” BM-25.0D+0.4 10” 21B ^{5,6} 4” CBR 30 ⁷

Execution Version
 Technical Requirements

Roadway	Limits ¹	Build-Up	Widening
I-66 & I-495 I/C Ramps and Loops ⁹	N/A	Mill 1.5" 1.5" SMA-9.5 (76-22) ³	1.5" SMA-9.5 (76-22) ³ 2" IM-19.0D 10.5" BM-25.0D+0.4 10" 21B ^{5,6} 4" CBR 30 ⁷
All Other Interchange Ramps/Loops/C-D Roads and Express Access Ramps not identified in Table 3.8.2 ⁹	N/A	Mill 1.5" 1.5" SMA-9.5 (76-22) ³	1.5" SMA-9.5 (76-22) ³ 2" IM-19.0D 12" BM-25.0D+0.4 6" 21B ^{5,6} 4" CBR 30 ⁷

Notes:

1. The Developer shall determine exact limits based upon archive plans and field verification of in-situ pavement sections
2. Thicknesses of existing pavement materials are approximate; Developer should expect some variability in these thicknesses; no impact methods to be used for removal (must saw cut and lift existing PCC slabs)
3. Final surface shall be placed in a continuous operation across the full pavement width after all previous layers have been completed in the salvage and widening sections
4. CTA = Agg. Base Material, Type I, Size No. 21A pugmill mixed with 4% hydraulic cement by weight
5. Connected to a standard UD-4 edg drain on the low side of the pavement cross slope
6. Replace 21B with CTA for widening on the high side of existing pavement cross-slopes
7. CBR 30 = Select Material, Type I, Min. CBR 30
8. Soil cement = subgrade soil mixed with min. 12% hydraulic cement by volume
9. All paved shoulders on interstate including ramps and loops shall have the same pavement section as the mainline lanes
10. Mainline pavement includes all acceleration/deceleration lanes and auxiliary lanes
11. 12" Continuously Reinforced Concrete Pavement (CRCP), Standard PR-8 with Class I corrosion resistant reinforcing steel (IIM S&B-81.5) and A4 paving concrete (SPCN) may be substituted for BM-25.0D+0.4
12. Reverse slope subgrade to drain towards UD-4 beneath outside edge of pavement in super-elevated sections

Table 3.7.2 – Connecting Roadways (Layers are listed top to bottom except as noted)

Roadway ¹	SM-9.5 ^{2,3}	IM-19.0A	BM-25.0D+0.4	OGDL ^{4,6}	CTA ⁵	21B ^{6,7}
Antioch Road – Widening/New Construction	1.5"	2"	4"	--	--	6"
Heathcote Boulevard – Extension/New Construction	1.5"	2"	6"	--	--	6"
Route 29 – Widening (North of I-66)	1.5"	2"	9.5"	--	--	8"
Route 29 – Widening (South of I-66)	1.5"	2"	12"	--	--	14
University Boulevard – Widening	1.5"	2"	8"	3"	6"	--
Route 234 By-Pass – Widening of ex. Ramps/Loops	1.5"	2"	6"	3"	6"	6"
Pageland Lane & Vandor Lane - Realignment	1.5"	2"	3"	--	--	6"
Cushing Road P&R Lot Access Road	1.5"	2"	6"	--	--	6"
Balls Ford Road – East (near Rest Area)	1.5"	2"	3"	--	--	6"
Balls Ford Road – West (near Groveton Rd) ⁹	1.5"	2"	6"	--	--	10"
Bull Run Drive – Widening/New Construction	1.5"	2"	4"	--	--	6"
Notes Dr Ext./Bull Run P&R Lot Access Road	1.5"	2"	6"	--	--	6"
Route 28 – New Construction	1.5"	2"	8"	3"	6"	--
Route 28 – Widening ¹⁰	1.5"	2"	8.5"	--	8"	4"
Braddock Road – Widening/New Construction	1.5"	2"	7"	--	--	6"
Walney Road – Widening/New Construction	1.5"	2"	7"	--	--	6"
Stonecroft Blvd/Poplar Tree Road – New Construction	1.5"	2"	4"	--	6"	--
EC Lawrence Park Access Road – New Construction	1.5"	2"	3"	--	6"	--
Stringfellow Road - Widening	1.5"	2"	8"	--	--	8"

Execution Version
 Technical Requirements

Roadway ¹	SM-9.5 ^{2,3}	IM-19.0A	BM-25.0D+0.4	OGDL ^{4,6}	CTA ⁵	21B ^{6,7}
Stringfellow Road Access Ramp	1.5"	2"	12"	--	--	10"
Fairfax County Parkway – Widening/New Construction	1.5"	2"	8"	3"	12"	--
West Ox Road – Widening/New Construction	1.5"	2"	6"	--	12"	--
Monument Drive – Widening/New Construction	1.5"	2"	7"	--	--	10"
Route 50 – Widening/New Construction	1.5"	2"	12"	--	--	6"
Waples Mill Road – Widening/New Construction	1.5"	2"	7"	--	--	6"
Jermantown Road – North Widening/New Construction	1.5"	2"	7"	3"	7"	--
Jermantown Road – South Widening only	1.5"	2"	8"	--	--	10"
Route 123 – New Construction	1.5"	2"	10"	--	6"	6"
Route 123 - Widening	1.5"	2"	6"	--	6" 21B ^{6,7}	8" CTA
Vaden Drive – Widening/New Construction	1.5"	2"	6"		6"	8"
Nutley Street – Widening/New Construction	1.5"	2"	10"	--	6"	6"
Nutley Street – Widening of ex. Ramps/Loops ⁹	1.5"	2"	4"	--	6"	6"
Cedar Lane – Widening/New Construction	1.5"	2"	6"	--	--	8"
Gallows Road	1.5"	2"	10"	--	--	8"

Notes:

1. All widened pavements shall be milled full width for at least the thickness of the proposed surface and within the limits of eradication of existing pavement markings
2. The final surface course shall be placed in a continuous operation across the full pavement width after all previous layers have been completed in the salvage and widening sections
3. For existing ADT < 10,000 vpd, use SM-9.5A; for ADT > 10,000 vpd, use SM-9.5D; for ADT >50,000 vpd, use SM-9.5E
4. OGDL = asphalt stabilized open graded drainage layer
5. CTA = Aggregate Base Material, Type I, Size No. 21A pugmill mixed with 4% hydraulic cement by weight
6. Connected to a standard UD-4 edgedrain on the low side of the pavement cross slope
7. Replace 21B with CTA for widening on the high side of existing pavement cross slopes
8. All widened pavement shall use the layers identified above or match the existing pavement layer thicknesses, whichever is greater
9. Mill 2" on existing pavement and then build-up with 3" IM-19.0A and 1.5" SM-9.5D
10. Mill 2" on existing pavement and then build-up with 3" BM-25.0D+0.4, 2" IM-19.0A and 1.5" SM-9.5D

Park and Ride Lots, Aisles and Entrance/Exit Roads (excluding bus transfer bays):

Surface – 1.5" Asphalt Concrete, Type SM-9.5A estimated at 175 lbs/sq.yd.

Base – 6" Asphalt Concrete, Type BM-25.0D+0.4

Subbase – 7" Aggregate Base Material, Type I, Size No. 21B extended 1 foot behind the curb and gutter and connected to an edgedrain, in accordance with UD-4 standard details.

If the number of parking spaces exceeds 2,000 or the subgrade soil CBR value is less than 5, the Developer shall increase the thicknesses of the above layers, as necessary to meet AASHTO design requirements in accordance with Chapter III of the Materials Division's Manual of Instructions.

Bus Loops and Transfer Bays:

Surface – 9" Hydraulic Cement Concrete Pavement in accordance with standard PR-2 with 15 foot transverse joint spacing.

Base – 6" Aggregate Base Material, Type I, Size No. 21B extended 1 foot behind the curb and gutter and connected to an edgedrain, in accordance with UD-4 standard details.

A joint layout plan shall be included in the final plans for construction. An expansion joint shall be placed between all concrete pavement and curb/gutter. If the number of bus trips exceeds 150/day or the subgrade soil CBR value is less than 5, the Developer shall increase the thicknesses of the above layers, as necessary to meet AASHTO design requirements in accordance with Chapter III of the Materials Division's Manual of Instructions.

Sidewalk and Shared Use Paths

Sidewalk

Surface - 4" Hydraulic Cement Concrete, Class A3

Base - 4" Aggregate base material Type I, Size No. 21A or No. 21B extended 4" on either side of the surface.

Shared Use Paths

Surface - 2" Asphalt Concrete, Type SM-9.0A estimated at 242 lbs/yd²

Base (only for areas subject to utility truck usage) – 3" Asphalt Concrete, Type IM-19.0A estimated at 345 lbs/yd²

Base - 6" Plain Aggregate, Type I, Size No. 21B extended 6" on either side of the surface.

Temporary Pavement

The Developer 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 the Department for review. All temporary pavement shall be completely removed once it is no longer in service. All temporary pavement designs for mainline or ramp pavements shall have a minimum 6 inches of asphalt concrete and shall meet the following minimum design criteria.

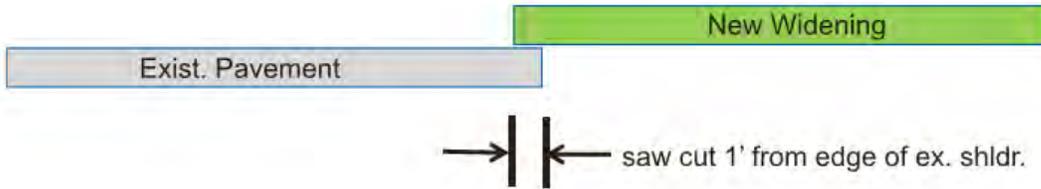
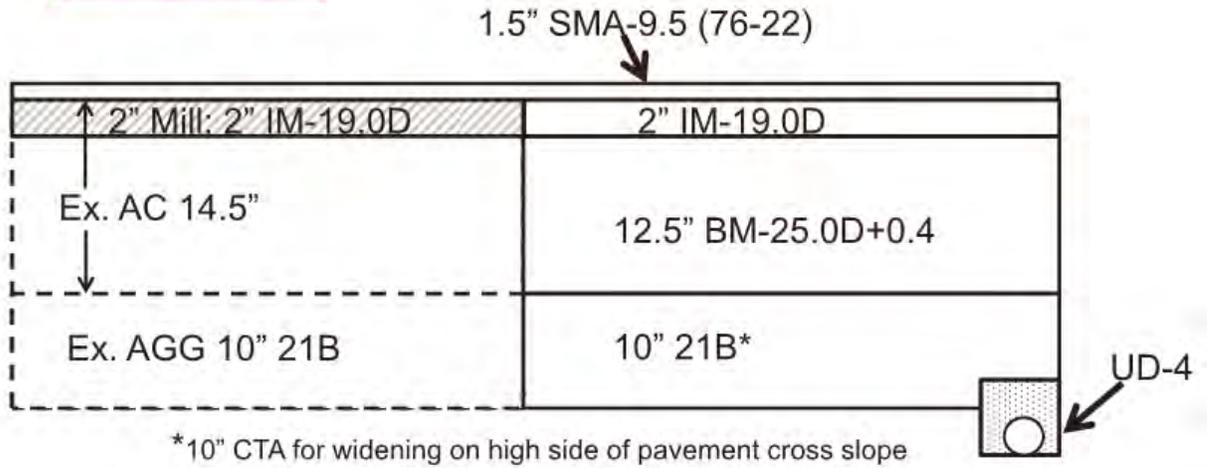
- Design Life – 6 months minimum, or required service life, whichever is greater
- Reliability – 85% minimum
- Initial Serviceability – 4.2 minimum
- Terminal Serviceability – 2.8 minimum
- Standard Deviation – 0.49 minimum
- CBR value for subgrade soils determined by laboratory tests

Note: Existing paved shoulders shall not be used for maintenance of traffic in their present condition unless approved by the Department.

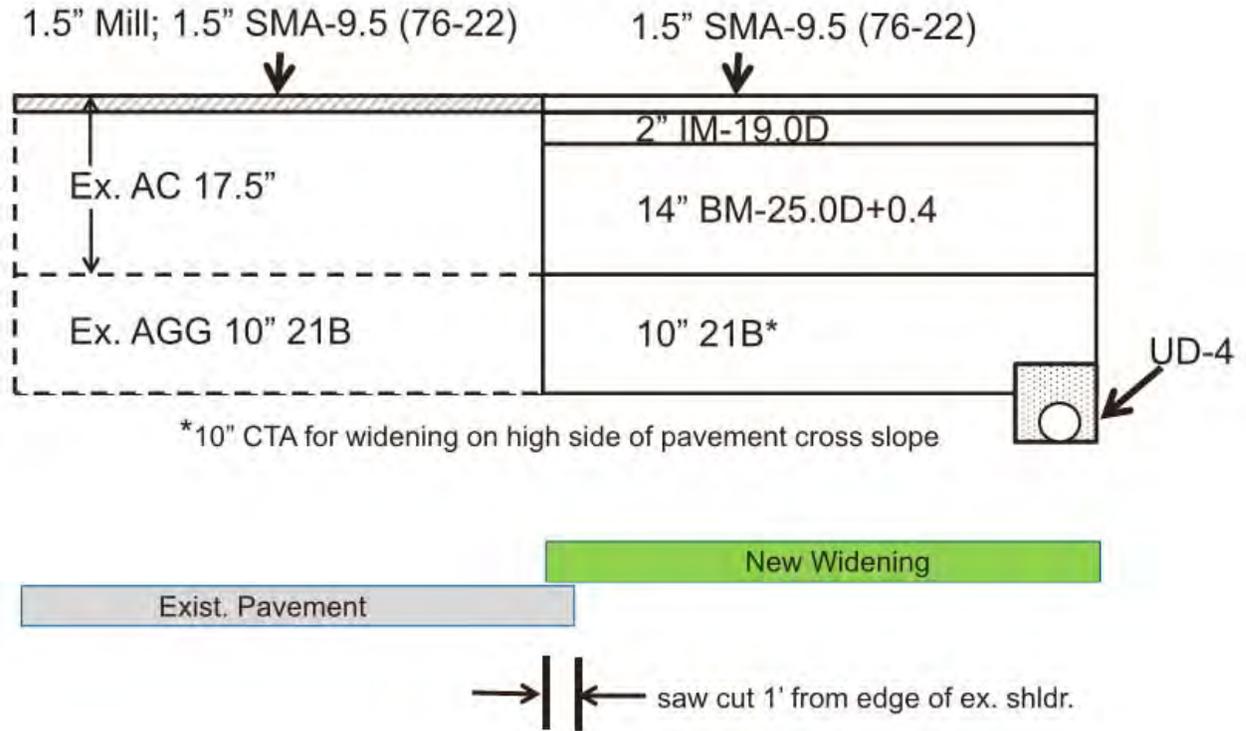
Typical Mainline Sections for I-66

1.18 Mi. W. of Route 15 to 0.02 Mi. E. of Catharpin Road

1.5" BUILD-UP

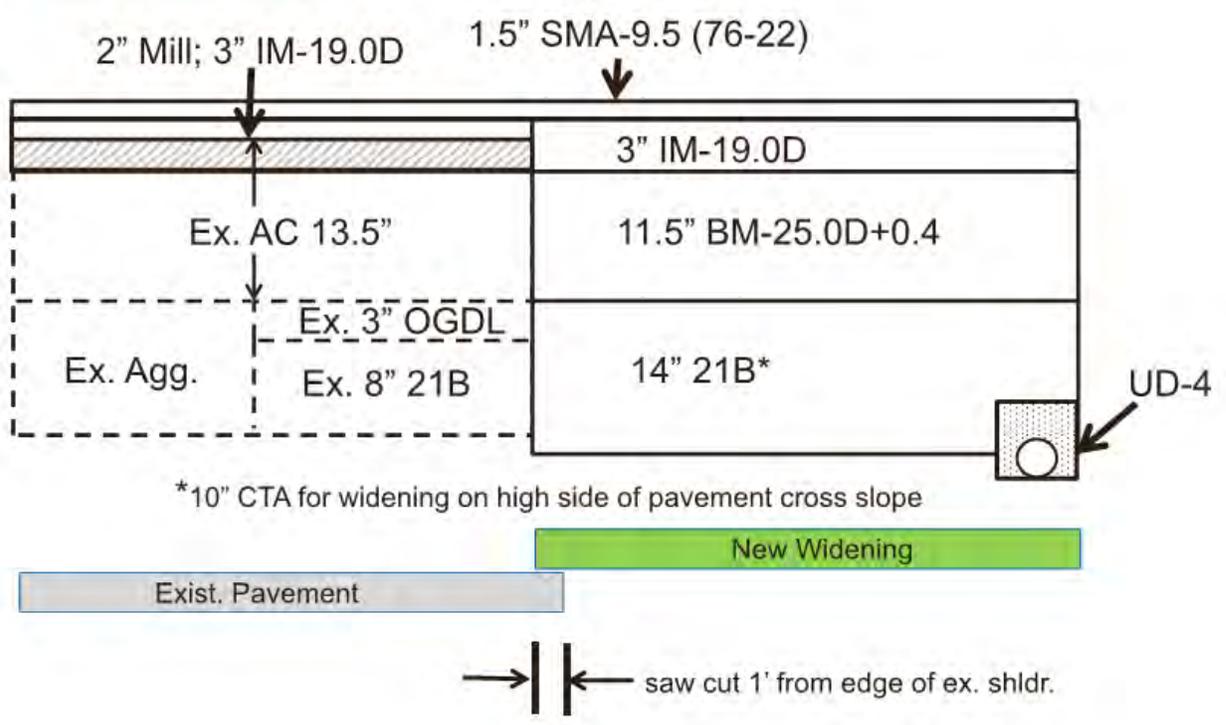


0.02 Mi. E. of Catharpin Road to 0.16 Mi. E. of Bus. Route 234



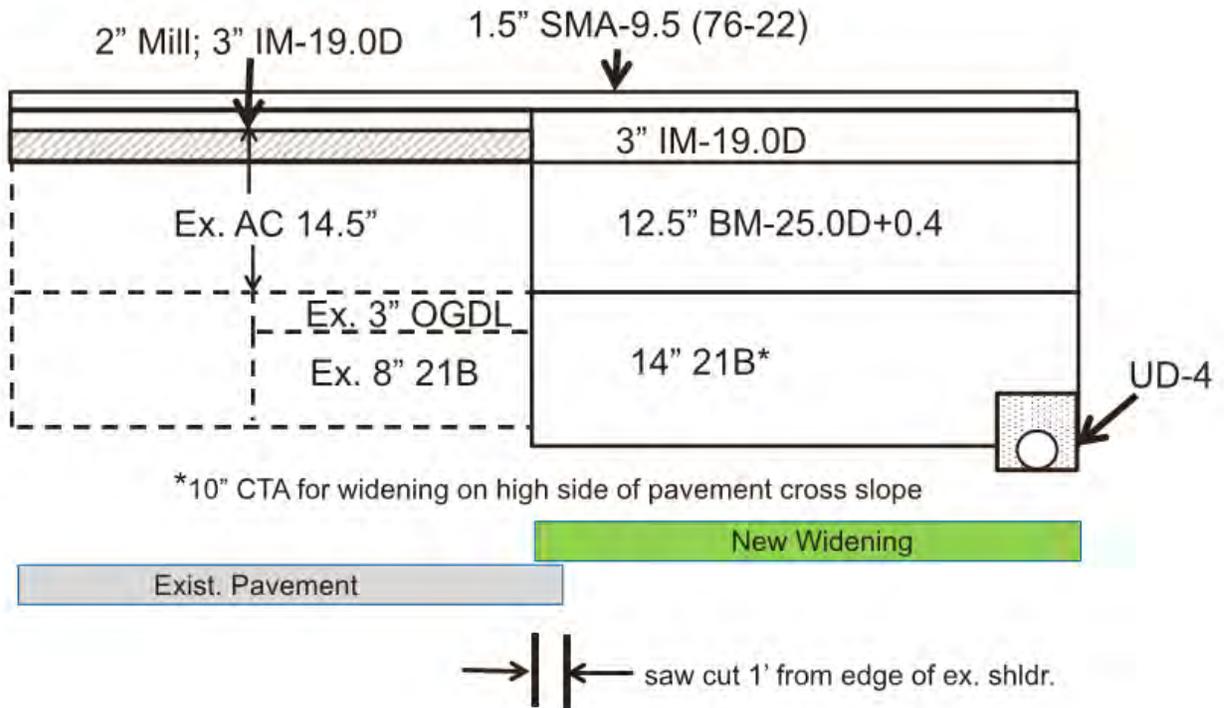
0.16 Mi. E. of Bus. Route 234 to 1.75 Mi. E. of Bus. Route 234

2.5" BUILD-UP

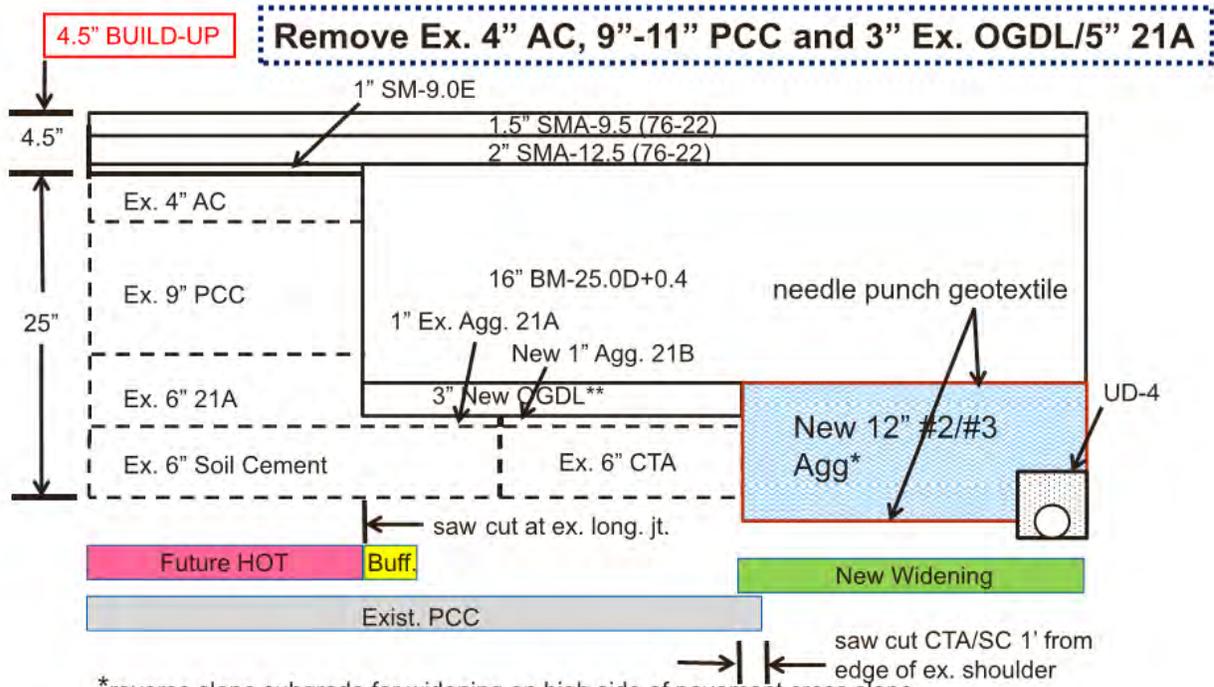


1.75 Mi. E. of Bus. Route 234 to 0.48 Mi. E. of Route 29

2.5" BUILD-UP



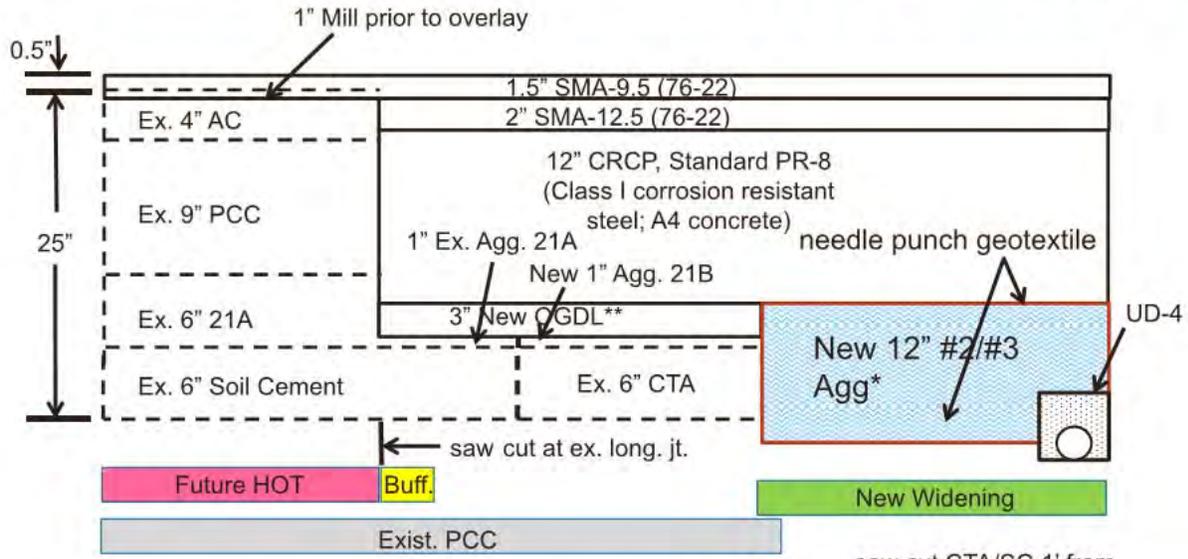
**Route 50 to I-495 (outside limits of Ex. Nutley Street C-D Road)
 Flexible Pavement Option – Salvage Ex. Pvmt. beneath Future HOT**



*reverse slope subgrade for widening on high side of pavement cross slope
 **connected to a standard UD-4 beneath the buffer strip in superelevated sections

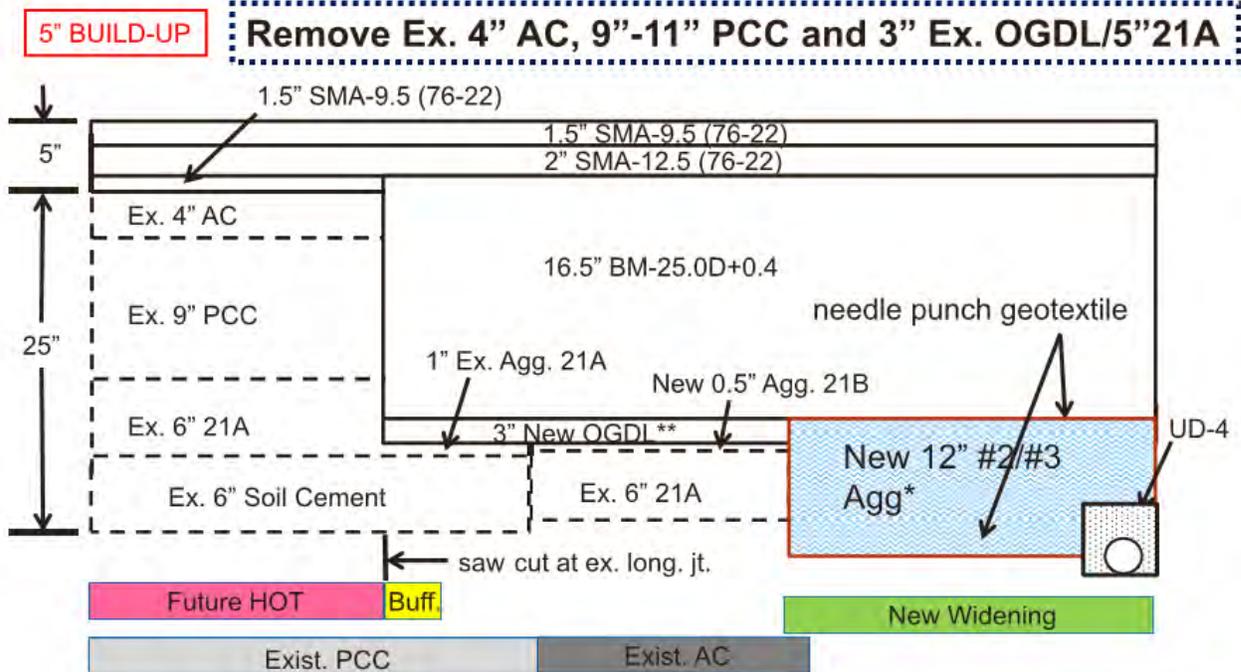
**Route 50 to I-495 (outside limits of Ex. Nutley Street C-D Road)
 Rigid Pavement Option – Salvage Ex. Pvmnt. beneath Future HOT**

0.5" BUILD-UP **Remove Ex. 4" AC, 9"-11" PCC and 3" Ex. OGDL/5" 21A**



*reverse slope subgrade for widening on high side of pavement cross slope
 **connected to a standard UD-4 beneath the buffer strip in superelevated sections

**Route 50 to I-495 (within limits of Ex. Nutley Street C-D Road)
 Flexible Pavement Option – Salvage Ex. Pvmnt. beneath Future HOT**

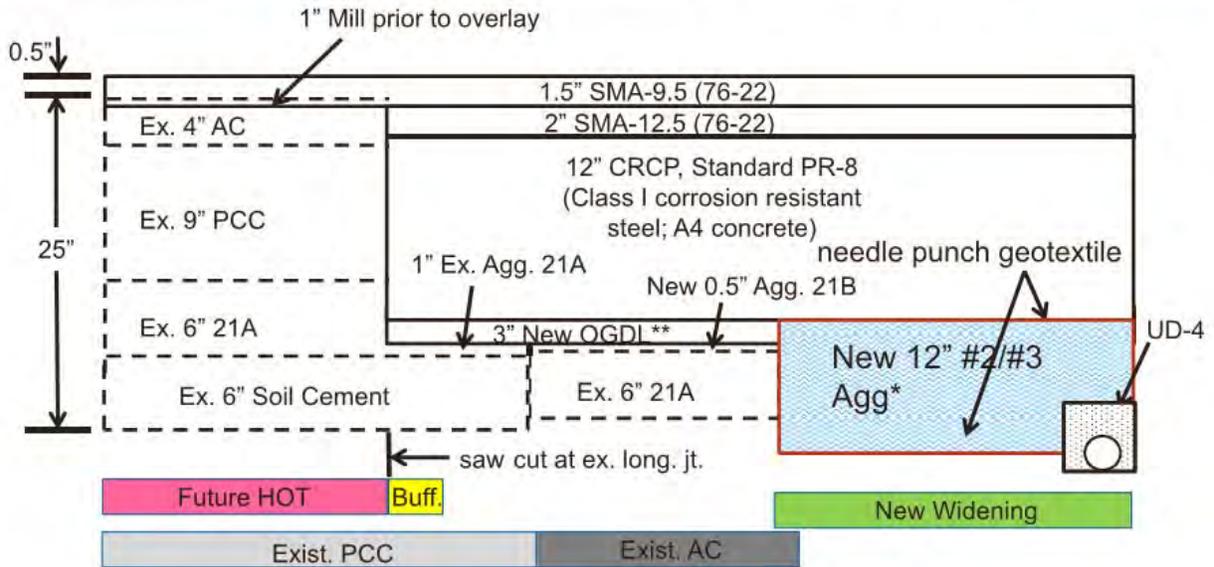


*reverse slope subgrade for widening on high side of pavement cross slope

**connected to a standard UD-4 beneath the buffer strip in superelevated sections

**Route 50 to I-495 (within limits of Ex. Nutley Street C-D Road)
 Rigid Pavement Option – Salvage Ex. Pvmt. beneath Future HOT**

0.5" BUILD-UP Remove Ex. 4" AC, 9"-11" PCC and 3" Ex. OGD/5"21A



*reverse slope subgrade for widening on high side of pavement cross slope

** connected to a standard UD-4 beneath the buffer strip in superelevated sections

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.11

Manassas National Battlefield Park

Proposed Reforestation Area



Proposed Reforestation Area, Manassas National Battlefield Park

Native species desired by the NPS: white oak (*Quercus alba*), pignut hickory (*Carya glabra*), eastern Redbud (*Cercis canadensis*), northern red oak (*Quercus rubra*), eastern red cedar (*Juniperus virginiana*), flowering dogwood (*Cornus florida*), and Virginia pine (*Pinus virginiana*).

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.14a

Bridge Replacements Table

Attachment 3.14a: Bridge Replacements Table

Transverse Sections shall be in accordance with Manual of the Structure and Bridge Division Volume V - Part 2 Chapter 6 unless noted below.

Facility Carried	Main Feature Intersected	Existing Federal ID / VA Struct. No.	FACILITIES INTERSECTED	LANE / SHOULDER WIDTHS FOR FACILITIES INTERSECTED	REPLACEMENT BRIDGE - TYPICAL SECTION	Bridge Information
Bull Run Drive Route 2548	I-66	6959 0296213	I-66 GP and Aux Lanes, Shldrs; I-66 Exp Lanes, Shldrs and future Metro facility	See attached	See attached	
Sully Road Route 28	I-66	6260 0291029	I-66 GP and Aux Lanes, Shldrs; I-66 XP Lanes, Shldrs, Bike Trail and future Metro facility.	See attached	See attached	
Lee Jackson Memorial Highway EBL Route 50	I-66	6299 0291121	I-66 GP, Aux and CD Lanes, Shldrs; I-66 XP Lanes, Shldrs, Bike Trail and future Metro facility.	See attached	See attached	
Lee Jackson Memorial Highway WBL Route 50	I-66	6297 0291120	I-66 GP, Aux and CD Lanes, Shldrs; I-66 XP Lanes, Shldrs, Bike Trail and future Metro facility.	See attached	See attached	
Lee Jackson Memorial Highway WBL Route 50	Ramp B (to I-66 EB)	6301 0292080	Rte. 50 EB Ramp Lane	See attached	See attached	

Attachment 3.14a: Bridge Replacements Table

Transverse Sections shall be in accordance with Manual of the Structure and Bridge Division Volume V - Part 2 Chapter 6 unless noted below.

Facility Carried	Main Feature Intersected	Existing Federal ID / VA Struct. No.	FACILITIES INTERSECTED	LANE / SHOULDER WIDTHS FOR FACILITIES INTERSECTED	REPLACEMENT BRIDGE - TYPICAL SECTION	Bridge Information
Waples Mill Road Route 665	I-66	6817 0296228	I-66 GP and Aux Lanes, Shldrs; I-66 XP and Ramp Lanes, Shldrs, Bike Trail and future Metro facility.	See attached	See attached	
Jermantown Road Route 655	I-66	6798 0296223	I-66 GP and Aux Lanes, Shldrs; I-66 XP Lanes, Shldrs, Bike Trail and future Metro facility.	See attached	See attached	
Chain Bridge Road SBL and NBL Route 123	I-66	6455 0291108	I-66 GP and Aux Lanes, Shldrs; I-66 XP Lanes, Shldrs and future Metro facility.	See attached	See attached	
Vaden Drive	I-66 & Metro	6198 0292262	I-66 GP, Aux and CD Lanes; I-66 XP and Ramp Lanes, Shldrs, Pedestrian Sidewalk and existing Metro facility	See attached	See attached	
Route 243 Nutley Street	I-66 & Metro	6492 0291163	I-66 GP and CD Lanes, Shldrs; I-66 XP Lanes, Shldrs and existing Metro facility.	See attached	See attached	

Attachment 3.14a: Bridge Replacements Table

Transverse Sections shall be in accordance with Manual of the Structure and Bridge Division Volume V - Part 2 Chapter 6 unless noted below.

Facility Carried	Main Feature Intersected	Existing Federal ID / VA Struct. No.	FACILITIES INTERSECTED	LANE / SHOULDER WIDTHS FOR FACILITIES INTERSECTED	REPLACEMENT BRIDGE - TYPICAL SECTION	Bridge Information
Cedar Lane	I-66 & Metro	6865 0296220	I-66 GP and Aux Lanes, Shldrs; I-66 XP Lanes, Shldrs, Bike Trail and existing Metro facility.	See attached	See attached	
Gallows Road	I-66 & Metro	6783 0296219	I-66 GP and Aux Lanes, Shldrs; I-66 XP Lanes, Shldrs, Bike Trail and existing Metro facility.	See attached	See attached	

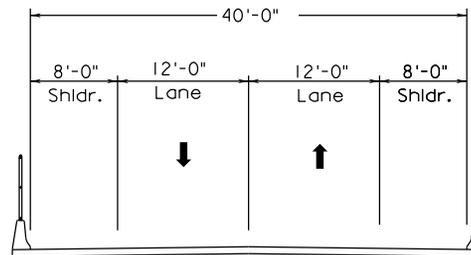
Notes:

1. Reference DE's and DW's as necessary
2. Replacement Bridge Typical Sections represent minimum bridge width requirements. Bridge width may need to be increased to meet project purpose and need.
3. Facilities Intersected listed in table above represent minimum requirements and may need to be modified to meet project purpose and need.

66 Express lanes Project

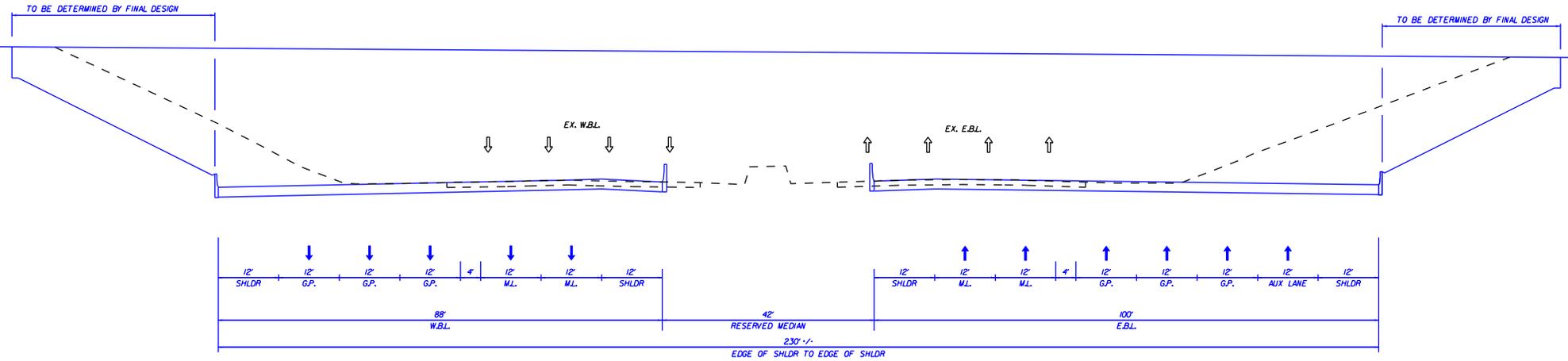
Attachment 3.14a

Typical Section - Bull Run Drive (Rte. 2548) over I-66



66 Express lanes Project

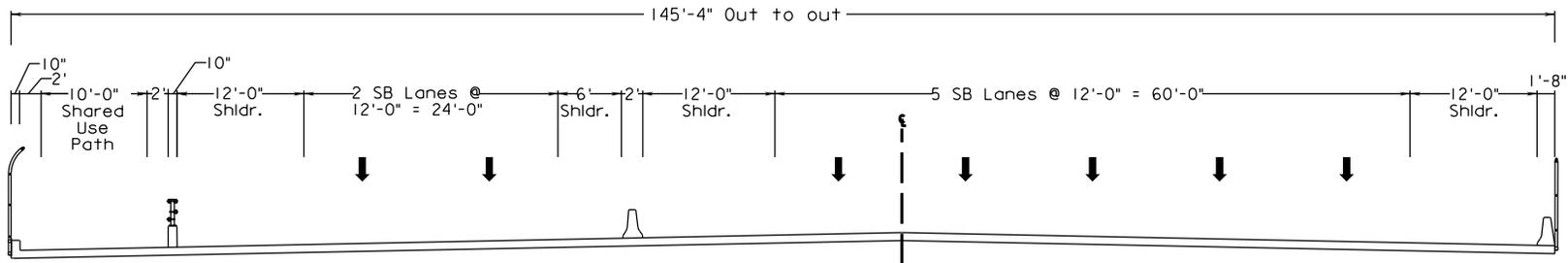
Proposed Facilities Under Bull Run Drive (Rte.2548) over I-66



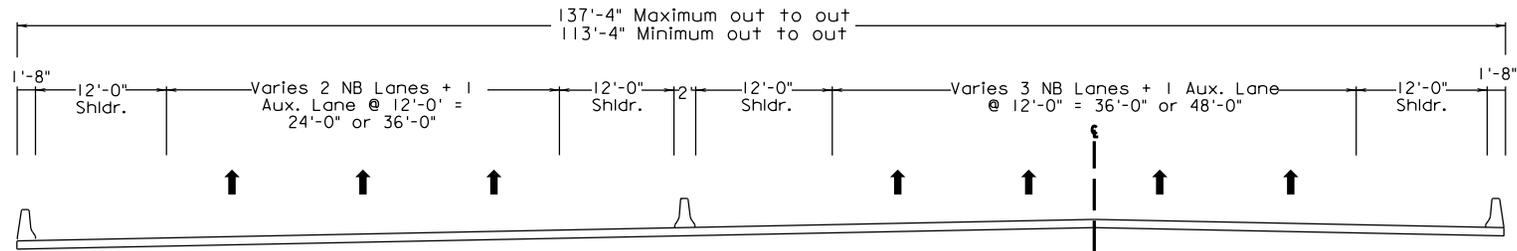
66 Express Lanes Project

Attachment 3.14a

Typical Section - Sully Road (Rte. 28) Southbound over I-66

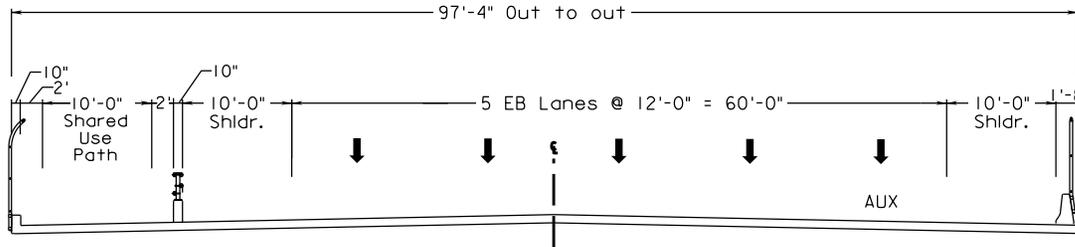


Typical Section - Sully Road (Rte. 28) Northbound over I-66

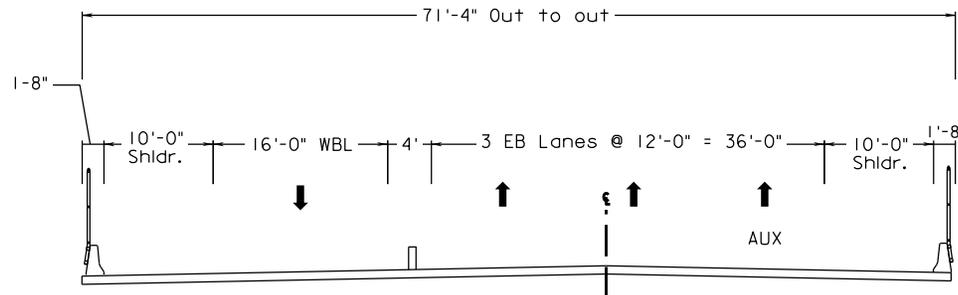


Attachment 3.14a

Typical Section - U.S. Rte. 50 EB over I-66 & Metro



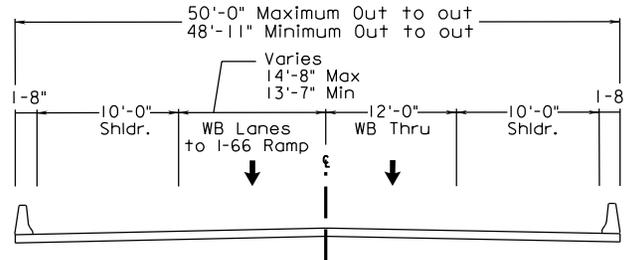
Typical Section - U.S. Rte. 50 WB over I-66 & Metro



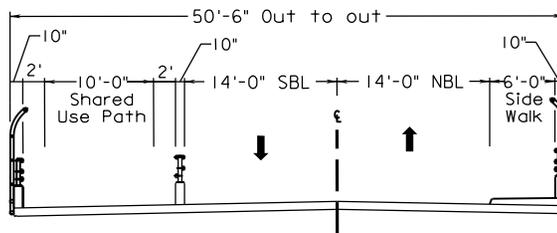
66 Express Lanes Project

Attachment 3.14a

Typical Section - U.S. Rte. 50 Over I-66 EB Ramp B (STA. 6032+00)



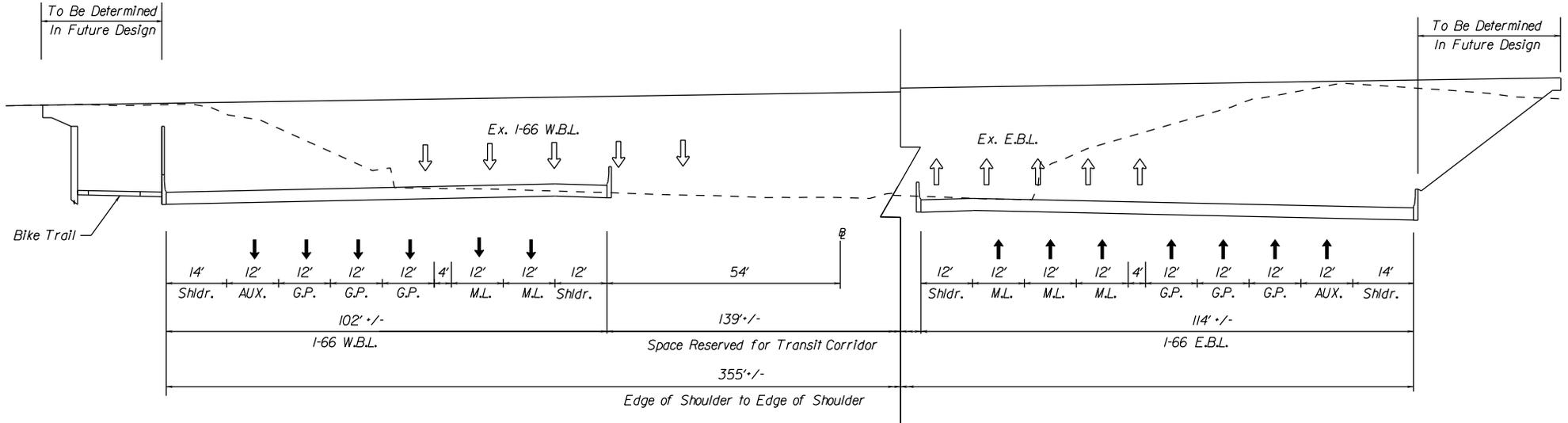
Typical Section - Waples Mill Road (Rte. 665) over I-66 & Metro



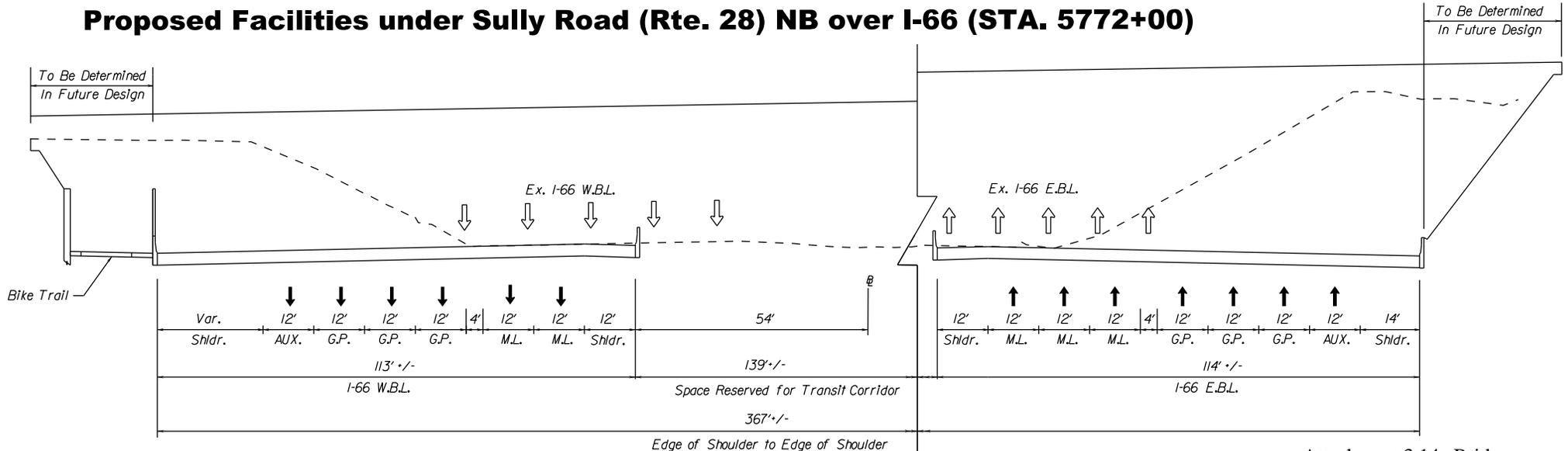
66 Express Lanes

Attachment 3.14a

Proposed Facilities under Sully Road (Rte. 28) SB over I-66 (STA. 5771+00)



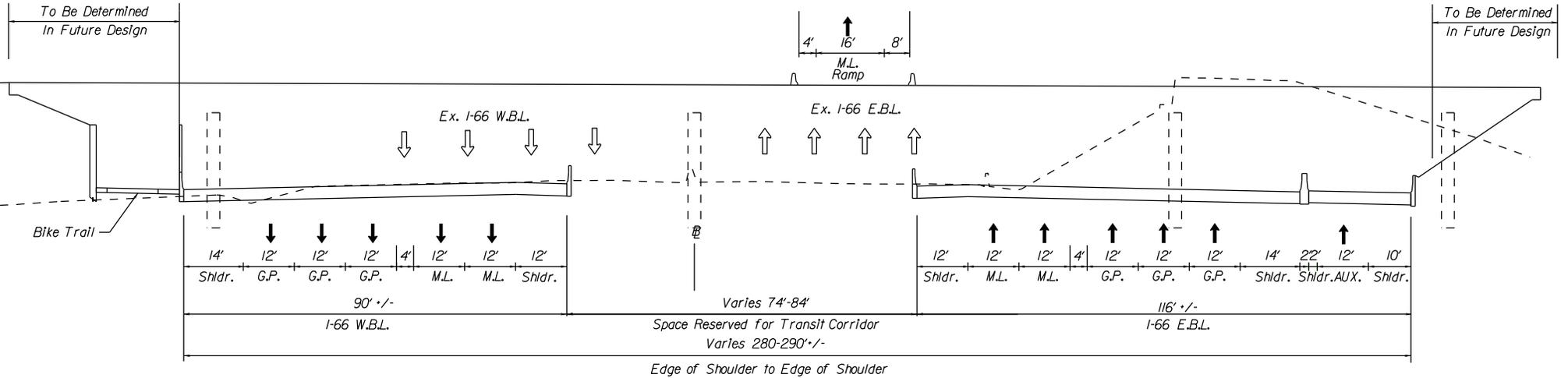
Proposed Facilities under Sully Road (Rte. 28) NB over I-66 (STA. 5772+00)



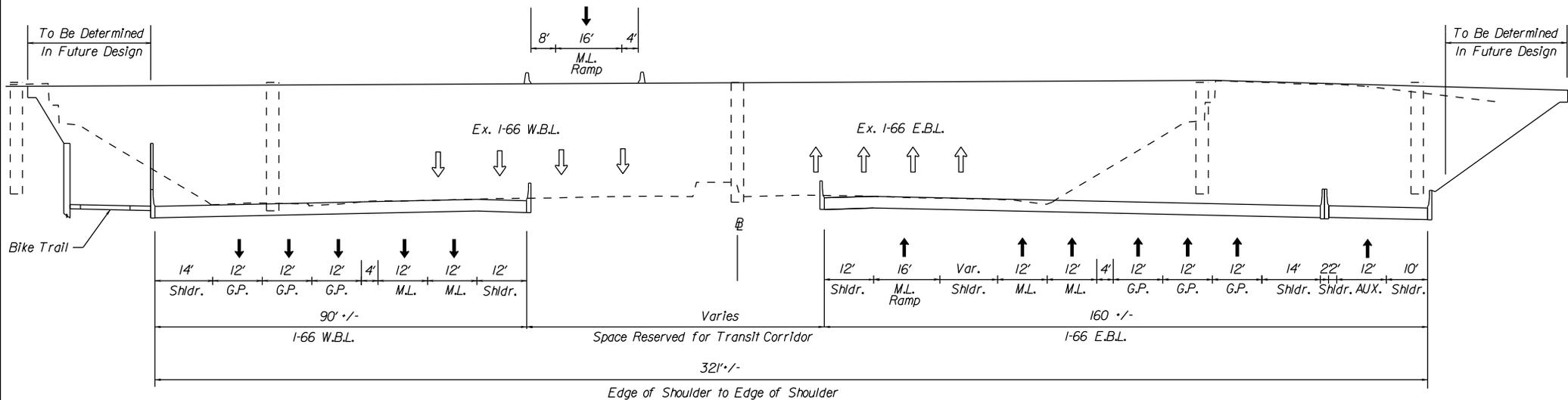
66 Express Lanes Project

Attachment 3.14a

Proposed Facilities under U.S. Route 50 EB over I-66 (STA. 6020+00)



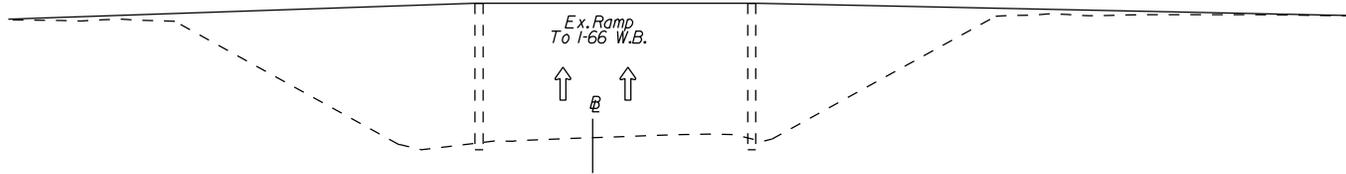
Proposed Facilities under U.S. Route 50 WB over I-66 (STA. 6028+00)



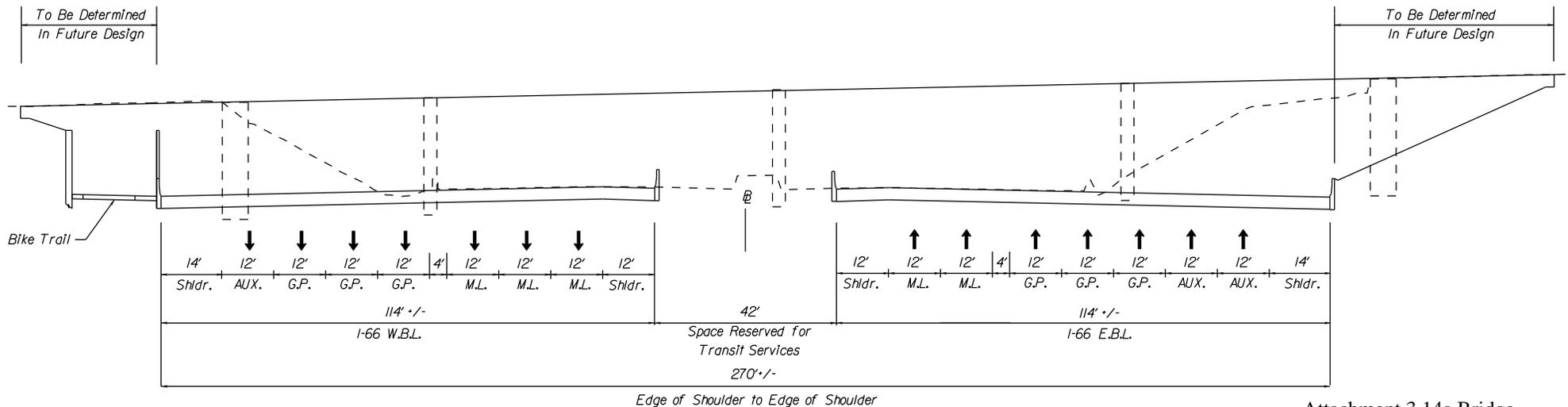
66 Express Lanes

Attachment 3.14a

Existing Facilities under U.S. Rte 50 WB over I-66 Ramp B (STA. 6032+00)



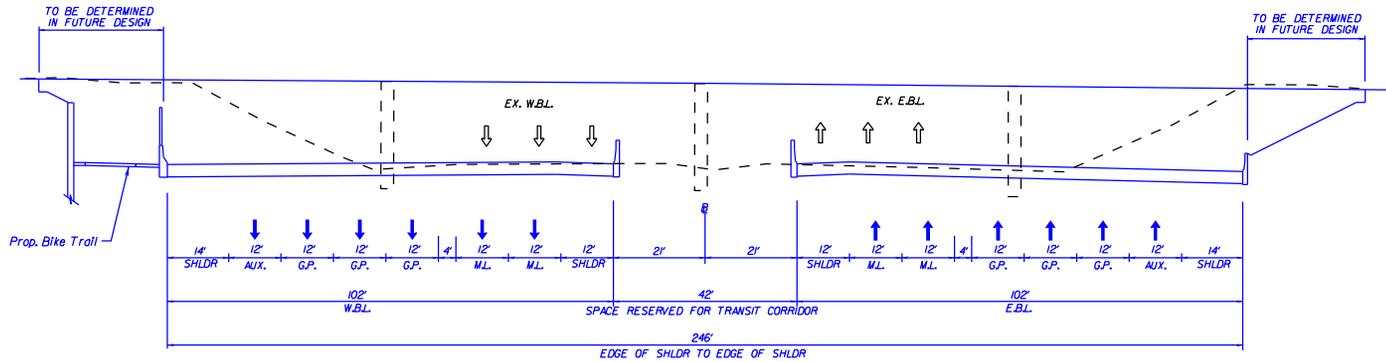
Proposed Facilities under Waples Mill Road (Rte. 665) over I-66 (STA. 6051+00)



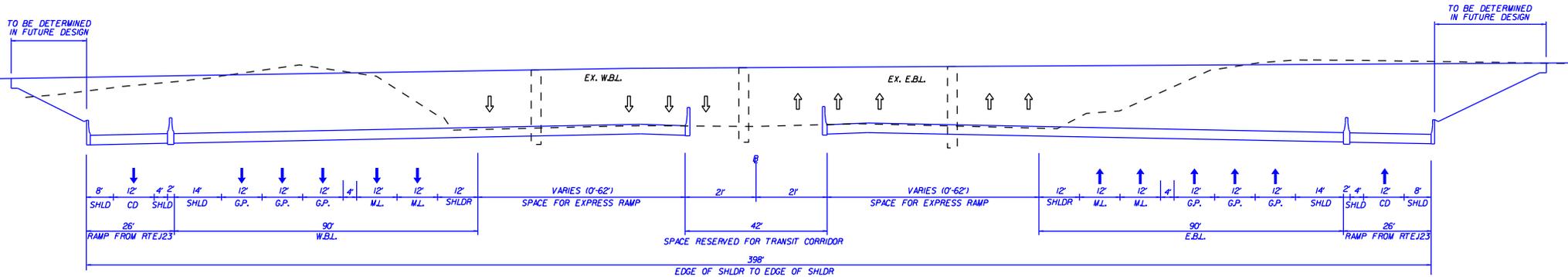
66 Express Lanes Project

Attachment 3.14a

Proposed Facilities Under Jermantown Road (Rte. 655) over I-66 & Metro (Sta. 6093+00)



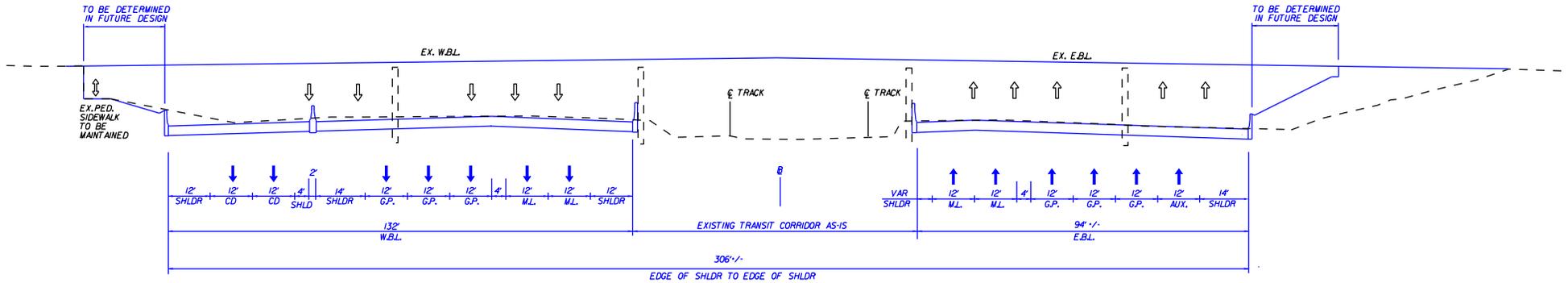
Proposed Facilities Under Chain Bridge Road (Rte. 123) over I-66 & Metro (Sta. 6131+50)



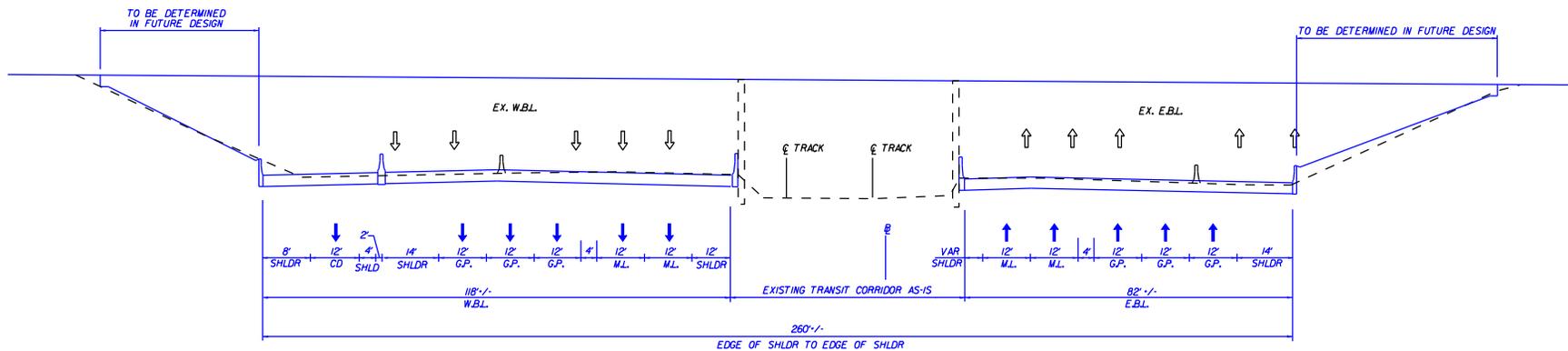
66 Express Lanes Project

Attachment 3.14a

Proposed Facilities Under Vaden Drive Bridge over I-66 & Metro (Sta. 6233+50)



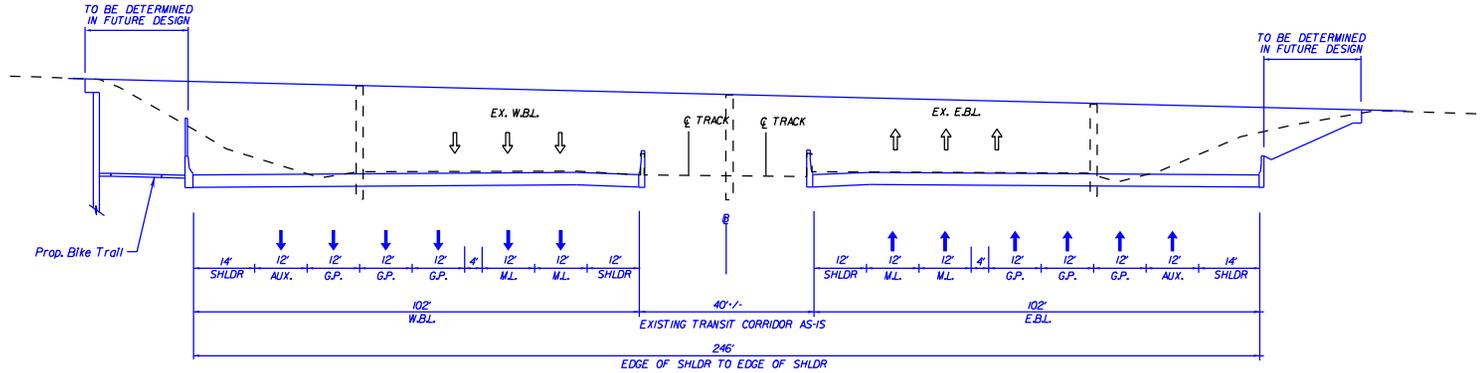
Proposed Facilities Under Nutley Street (Rt. 243) over I-66 & Metro (Sta. 6256+00)



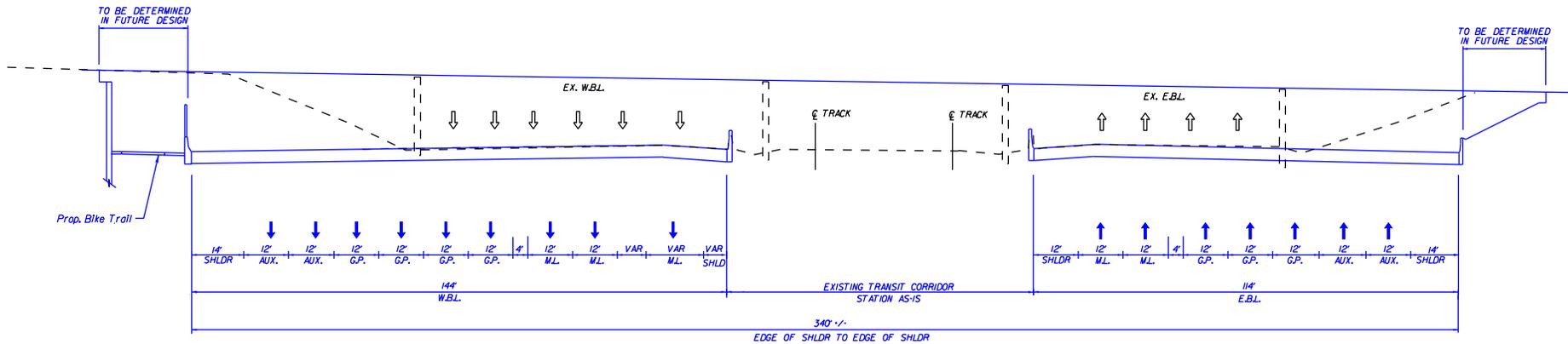
66 Express Lanes Project

Attachment 3.14a

Proposed Facilities Under Cedar Lane (Rte. 698) over I-66 & Metro (Sta. 6314+00)



Proposed Facilities Under Gallows Road (Rte. 650) over I-66 & Metro (Sta. 6370+00)

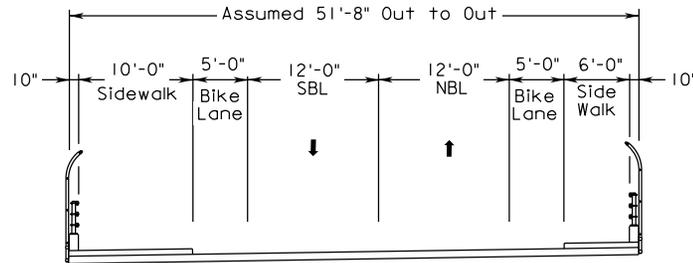


66 Express Lanes Project

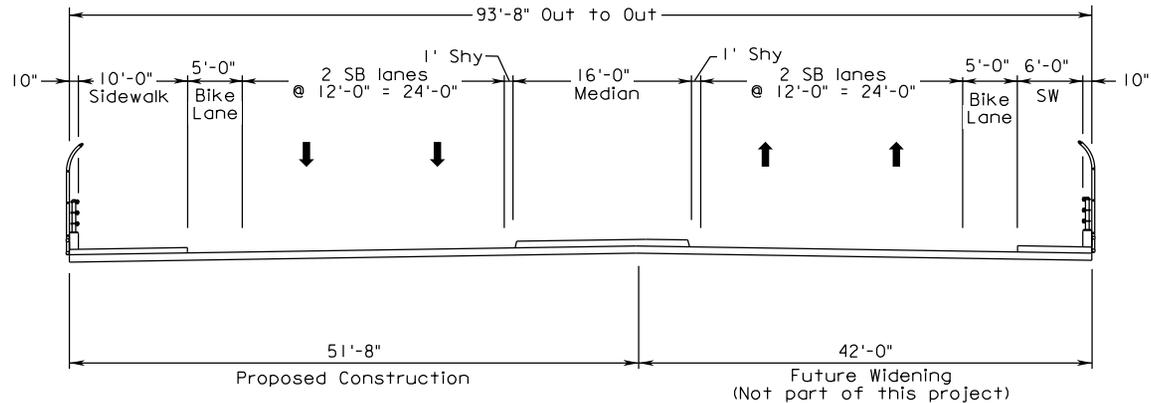
Attachment 3.14a

Typical Section - Jermantown Road (Rte. 655) over I-66 & Metro (As Per Current Plan)

Note: Design shall accommodate future widening as shown below



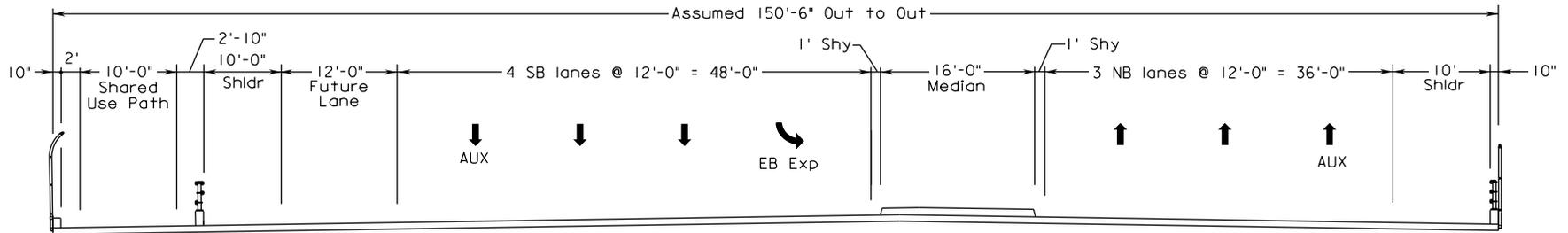
Typical Section (Showing Future Widening) - Jermantown Road (Rte. 655) over I-66 & Metro



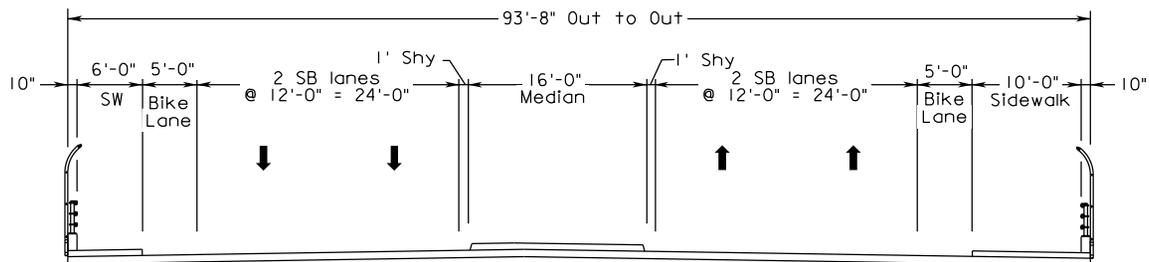
66 Express Lanes Project

Attachment 3.14a

Typical Section - Chain Bridge Road (Rte. 123) over I-66 & Metro



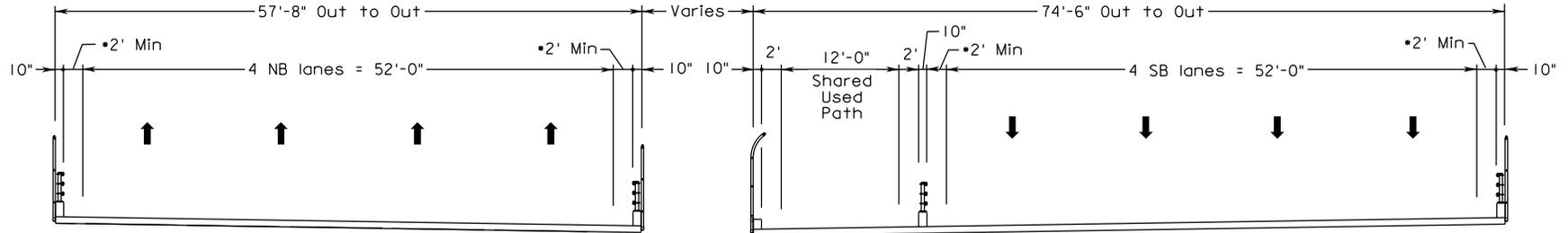
Typical Section - Vaden Drive over I-66 & Metro



66 Express Lanes Project

Attachment 3.14a

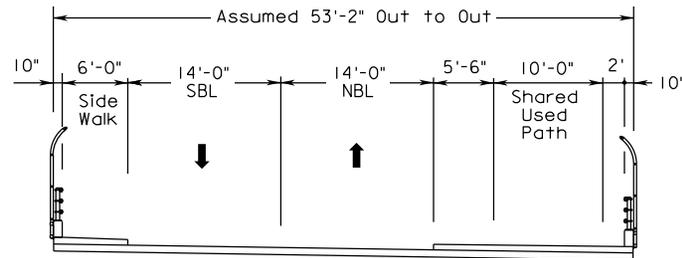
Typical Section - Nutley Street (Rte. 243) over I-66 & Metro



Note:

- Provide 2' Min. or width necessary to meet Sight Stopping Distance on the ramps.

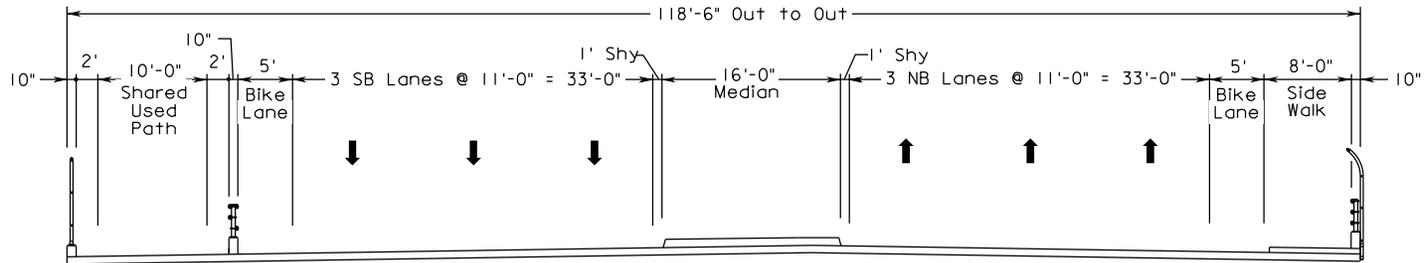
Typical Section - Cedar Lane (Rte. 698) over I-66 & Metro



66 Express Lanes Project

Attachment 3.14a

Typical Section - Gallows Road (Rte. 650) over I-66 & Metro



Transform 66 P3 Project

Exhibit C

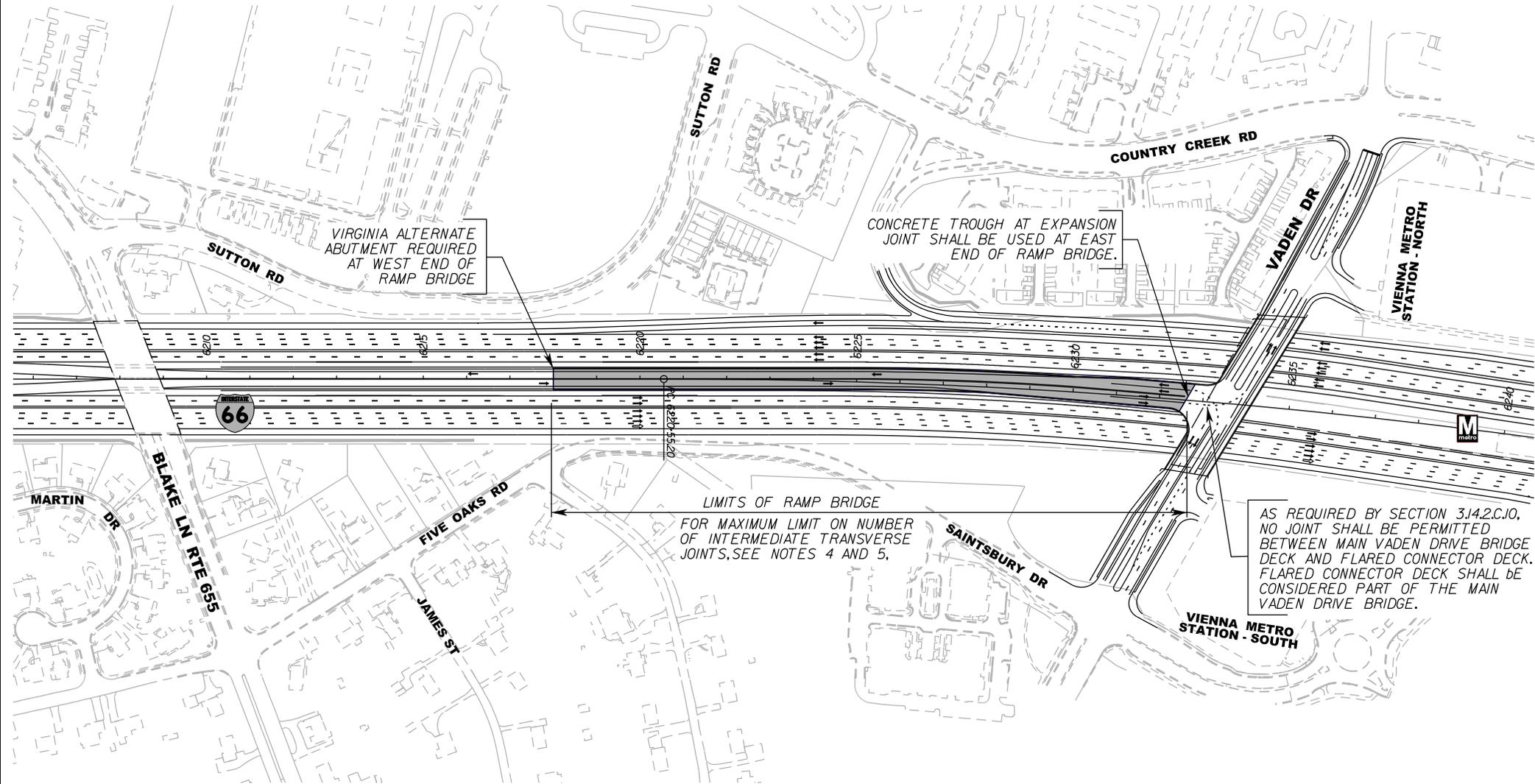
Technical Requirements

Attachment 3.14b

Proposed Facilities at Proposed Express Lanes Access Ramp Structure at Vaden Drive

Attachment 3.14b

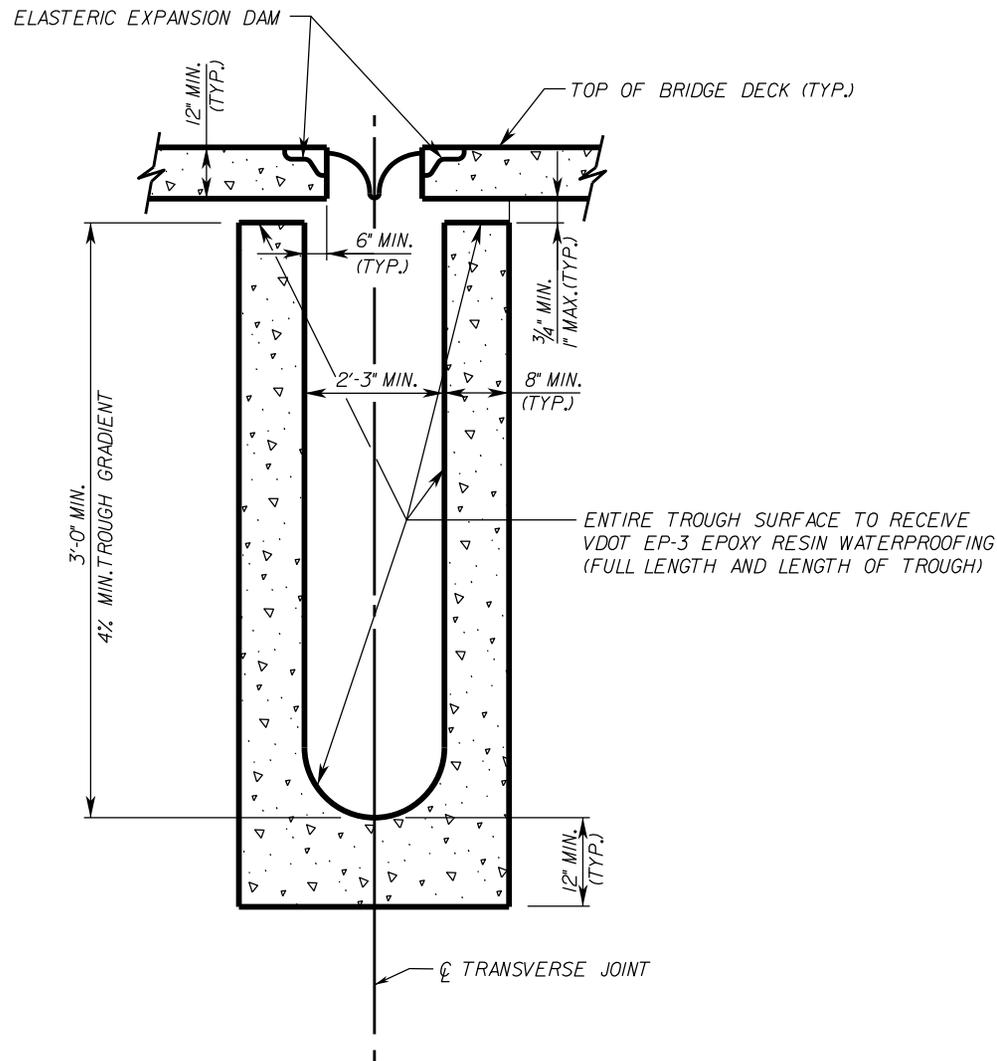
Proposed Facilities at Proposed Express Lanes Access Ramp Structure at Vaden Drive



66 Express Lanes

Attachment 3.14b

Proposed Facilities at Proposed Express Lanes Access Ramp Structure at Vaden Drive



NOTES:

1. CRR STEEL CLASS III SHALL BE USED FOR ALL REINFORCING STEEL IN CONCRETE TROUGH.

2. TWO LAYERS OF STEEL SHALL BE USED IN TROUGH WALLS AND BASE (3" MIN. COVER ON TROUGH SIDE).

3. THE TROUGH SHALL BE CONNECTED TO A CLOSED DRAINAGE SYSTEM SUCH THAT NO RUNOFF (INCLUDING WATER USED FOR FLUSHING THE TROUGH) SHALL BE PERMITTED TO DISCHARGE AT ENDS OF TROUGH.

FIGURE 1 - TROUGH DETAIL

Attachment 3.14b

Proposed Facilities at Proposed Express Lanes Access Ramp Structure at Vaden Drive

NOTES:

- 1. ONLY STEEL I-GIRDERS OR PRESTRESSED BULB-T GIRDERS WILL BE PERMITTED AS MAIN SUPPORTING MEMBERS IN BRIDGE SUPERSTRUCTURE.*
- 2. REGARDLESS OF THE ORIENTATION OF THE MAIN SUPPORTING GIRDERS, THE TRANSVERSE DIRECTION IS DEFINED AS THAT DIRECTION GENERALLY ORIENTED PERPENDICULAR TO METRO TRACKS AND THE LONGITUDINAL DIRECTION IS THAT DIRECTION GENERALLY ORIENTED PARALLEL TO METRO TRACKS.*
- 3. NO LONGITUDINAL JOINTS WILL BE PERMITTED.*
- 4. IF ORIENTATION OF MAIN SUPPORTING GIRDERS IS LONGITUDINAL, THEN THE FOLLOWING REQUIREMENTS SHALL APPLY:
I. EXCLUSIVE OF THE JOINTS AT THE WEST AND EAST ENDS OF THE BRIDGE, NO MORE THAN FIVE (5) INTERMEDIATE TRANSVERSE OPEN / EXPANSION TRANSVERSE JOINTS SHALL BE PERMITTED.
II. THE CONCRETE TROUGH DETAIL SHOWN IN FIG.1 SHALL BE USED AT EACH INTERMEDIATE JOINT LOCATION.*
- 5. IF THE ORIENTATION OF THE MAIN SUPPORTING GIRDERS IS TRANSVERSE, THEN THE FOLLOWING REQUIREMENTS SHALL APPLY:
I. EXCLUSIVE OF THE JOINTS AT THE WEST AND EAST ENDS OF THE BRIDGE, NO MORE THAN NINE (9) INTERMEDIATE TRANSVERSE OPEN/EXPANSION JOINTS SHALL BE PERMITTED.
II. THE CONCRETE TROUGH DETAIL SHOWN IN FIG.1 SHALL BE USED AT EACH INTERMEDIATE JOINT LOCATION.
III. ALL GIRDER ENDS SHALL BE FULLY ENCAPSULATED BY A CURTAIN WALL. CURTAIN WALLS SHALL BE CONNECTED TO ENDS OF GIRDERS IN A MANNER SIMILAR TO THAT USED FOR SEMI-INTEGRAL BACKWALLS, AS SHOWN IN THE DETAILS INCLUDED IN CHAPTER 17, VOLUME 5, PART 2 OF THE STRUCTURE AND BRIDGE MANUALS.*
- 6. WITH THE USE OF ALTERNATE VIRGINIA ABUTMENT AT THE WEST END OF BRIDGE AND SPECIAL CONCRETE TROUGH DETAIL SHOWN IN FIG.1 OF THIS ATTACHMENT AT ALL JOINTS, THIS RAMP BRIDGE STRUCTURE MAY BE CONSIDERED TO BE IN COMPLIANCE WITH THE JOINTLESS DESIGN CONCEPT FOR THE PURPOSE OF DETERMINING LIMITS OF STRUCTURAL STEEL PAINTING.*

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.14c

Existing Bridges and Culverts Information Table

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
Segment 1					
University Blvd. Route 840	I-66 & Norfolk Southern Railroad	26694 0766188	285-18	Yes	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
Ramp A of PWP Rte. 234	Tributary of Catharpin Run (Culvert)	25234 0761042	-	-	Meet project purpose and need. *Double Box Culvert 6'W x 4'H x 47'
I-66 & Pageland Lane	Tributary of Young's Branch (Culvert)	24862 0762029	-	-	Meet project purpose and need. *Triple Box Culvert 6'W x 5'H x 288' (Total length = 24.9')
Prince William Parkway EBL Route 234 Bypass	I-66	24787 0761052	271-72	No	Meet project purpose and need
Prince William Parkway WBL Route 234 Bypass	I-66	24788 0761053	271-72	No	Meet project purpose and need
I-66	Tributary of Young's Branch (Culvert)	14209 0762047	-	-	Meet project purpose and need. *Double Box Culvert (sizes differ)
Groveton Road	I-66	25960 0766082	280-04	No	Meet project purpose and need
I-66	Tributary of Holkums Branch (Culvert)	28465 0762033	-	-	Meet project purpose and need. *Double Box Culvert 5' x 5' x 270'

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66	Tributary of Young's Branch (Culvert)	28464 0762032	–	–	Meet project purpose and need. *Double Box Culvert 8' x 4' x 291'
I-66	Tributary of Young's Branch (Culvert)	28463 0762030	–	–	Meet project purpose and need. *Double Box Culvert 8' x 4' x 213'
I-66 WBL	Sudley Road Route 234	14202 0762000	136-21, A, B, C	No	Meet project purpose and need.
I-66 EBL	Sudley Road Route 234	28305 0762001	136-21, A, B, C, D	Yes	Meet project purpose and need.
I-66	Holkums Branch (Culvert)	14208 0762046	–	–	Meet project purpose and need. *Single Box 6' x 6' x 369'
I-66 WBL	Bull Run	6380 0292900	136-22, A, B, C	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 EBL	Bull Run	6381 0292901	136-22, A, B, C	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
Bull Run Drive Route 2548	I-66	6959 0296213	136-16, A	No	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
I-66 WBL	Cub Run	24993 0292010	272-29	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66 EBL	Cub Run	24994 0292011	272-29	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 WBL	Compton Road Route 658	6311 0292012	136-19, A, B, C	Yes	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 EBL	Compton Road Route 658	6313 0292013	136-19, A, B, C	Yes	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66	Branch of Big Rocky Run (Culvert)	6328 0292123	—	—	Meet project purpose and need. Double Box Culvert 6' x 6' x 465'
I-66 WBL	Lee Highway Route 29 (Centreville)	6315 0292019	148-07, A, B, C, D, E, F	Yes	Meet project purpose and need.
I-66 EBL	Lee Highway Route 29 (Centreville)	6317 0292020	148-07, A, B, C, D, E, F	Yes	Meet project purpose and need.
I-66	Branch of Big Rocky Run (Culvert)	6319 0292057	—	—	Meet project purpose and need. *Triple Box Culvert 5' x 5' x 321'
Sully Road Route 28	I-66	6260 0291029	260-31, A, B	Yes	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
I-66	Branch of Big Rocky Run (Culvert)	6329 02922124	—	—	Meet project purpose and need. *Single Box Culvert 6' x 6' x 225'

Segment 2

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66 WBL	Stringfellow Road Route 645	6320 0292059	271-09	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 EBL	Stringfellow Road Route 645	6322 0292060	271-09	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 WB CD Road	Fairfax County Parkway Route 286	24090 0292091	269-55	Yes	Meet project purpose and need.
I-66 WBL	Fairfax County Parkway Route 286	6376 0292266	268-21, A	Yes	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 EBL	Fairfax County Parkway Route 286	6378 0292267	268-21, A	Yes	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 EB CD Road	Fairfax County Parkway Route 286	24089 0292099	269-56	Yes	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66	Tributary of Big Rocky Run (Culvert)	6330 0292126	–	–	Meet project purpose and need. *Double Box Culvert 4' x 6' x 166'
West Ox Road Route 608	I-66	6667 0296229	268-25	No	Meet project purpose and need.

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
Monument Drive Route 7969	I-66 & Route 656	7076 0296023	268-18, A	No	Bridge modifications necessary to meet project purpose and need and the requirements of attachment 3.14d Bridge Widening and Repairs.
Lee Jackson Memorial Highway EBL Route 50	I-66	6299 0291121	148-09, A	Yes	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
Lee Jackson Memorial Highway WBL Route 50	I-66	6297 0291120	148-10, A	No	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
Lee Jackson Memorial Highway WBL Route 50	I-66 EB Ramp B	6301 0291122	148-11	No	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
I-66 Ramp A (Rte. 50 Interchange)	Difficult Run (Culvert)	6331 0292133	-	-	Meet project purpose and need. *Triple Box Culvert 6' x 8' x 903'
Ramp F (Rte. 50 Interchange)	Tributary of Difficult Run (Culvert)	6345 0292172	-	-	Meet project purpose and need. *Triple Box Culvert 6' x 8' x 335'
Ramp E (Rte. 50 Interchange)	Tributary of Difficult Run (Culvert)	6344 0292171	-	-	Meet project purpose and need. *Double Box Culvert 5' x 6' x 253'

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66	Tributary of Difficult Run (Culvert)	6332 0292134	—	—	Meet project purpose and need. *Double Box Culvert 5' x 6' x 287'
Ramps B and H (Rte. 50 Interchange)	Tributary of Difficult Run (Culvert)	6343 0292169	—	—	Meet project purpose and need. *Double Box Culvert 5' x 6' x 174'
Waples Mill Road Route 665	I-66	6817 0296228	148-14, A	Yes	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
I-66	Tributary of Difficult Run (Culvert)	6333 0292135	—	—	Meet project purpose and need. *Double Box Culvert 4' x 6' x 305'
Segment 3					
Jermantown Road Route 655	I-66	6798 0296223	148-05, A	Yes	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
I-66	Tributary of Accotink Creek (Culvert)	6334 0292136	—	—	Meet project purpose and need. *Double Box Culvert 4' x 6' x 30'
Rte. 123 Ramp to I-66 WB	Tributary of Accotink Creek (Culvert)	6353 0292196	—	—	Meet project purpose and need. *Double Box Culvert 4' x 6' x 30'
Ramp A of I-66	Tributary of Accotink Creek (Culvert)	6347 0292174	—	—	Meet project purpose and need. *Double Box Culvert 5' x 6' x 258'
Ramp A of I-66	I-66	6326 0292080	148-12, A	Yes	Meet project purpose and need.

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
Rte. 123 Ramp to I-66 EB	Tributary of Daniels Run (Culvert)	6351 0292194	—	—	Meet project purpose and need. *Double Box Culvert 5' x 6' x 276'
Chain Bridge Road SBL Route 123	Ramp A	6459 0291110	148-13, A, B	Yes	Meet project purpose and need.
Chain Bridge Road NBL Route 123	Ramp A	6461 0291111	148-13, A, B	No	Meet project purpose and need.
Chain Bridge Road SBL Route 123	I-66	6455 0291108	148-06 A, B, C	Yes	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
Chain Bridge Road NBL Route 123	I-66	6457 0291109	148-06, A, B, C	No	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.
Rte. 123 Ramp to I-66 EB	Tributary of Accotink Creek (Culvert)	6352 0292195	—	—	Meet project purpose and need. *Double Box Culvert 4' x 5' x 82'
I-66 Ramp to Rte. 123 NB	Tributary of Accotink Creek (Culvert)	6346 0292173	—	—	Meet project purpose and need. *Double Box Culvert 4' x 4' x 64'
I-66	Tributary of Accotink Creek (Culvert)	6335 0292137	—	—	Meet project purpose and need. *Double Box Culvert 4' x 5' x 190'
I-66	Tributary of Accotink Creek (Culvert)	6336 0292138	—	—	Meet project purpose and need. *Triple Box Culvert 5' x 5' x 247'

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66	Tributary of Accotink Creek (Culvert)	6337 0292139	–	–	Meet project purpose and need. *Single Box Culvert 6' x 6' x 251'
I-66	Tributary of Accotink Creek (Culvert)	6338 0292140	–	–	Meet project purpose and need.
Blake Lane Route 655	I-66	6796 0296218	264-16	Yes	Meet project purpose and need
I-66	Tributary of Accotink Creek (Culvert)	6339 0292141	–	–	Meet project purpose and need. *Double Box Culvert 5' x 6' x 413', Double 4' x 4' BC adjoins into this BC at middle and ends at same. Outlet shows a quadruple BC.
Vaden Drive	I-66 & Metro	6198 0292262	260-81, A	Yes	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements and Attachment 3.14b Vaden Ramp .
WMATA Pedestrian Bridge	I-66 WBL	6384 Not avail.	–	–	Meet project purpose and need.
WMATA Pedestrian Bridge	I-66 EBL	6385 Not avail.	–	–	Meet project purpose and need.
I-66	Tributary of Accotink Creek (Culvert)	6340 0292142	–	–	Meet project purpose and need. *Double Box Culvert 10' x 12' x 1700'
Nutley Street Route 243	I-66 & Metro	6492 0291163	258-42, A, B	Yes	Meet project purpose and need and the requirements of Attachment 3.14a Bridge Replacements.

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66 & Metrorail	Bear Branch (Culvert)	6341 0292143	–	–	Meet project purpose and need. *Double Box Culvert 10' x 10' x 288'
Cedar Lane Route 698	I-66 & Metro	6865 0296220	162-03, A	Yes	Meet project purpose and need and the requirements of attachment 3.14a Bridge Replacements.
WMATA Pedestrian Bridge	I-66 EBL	6383 Not avail.	–	–	Meet project purpose and need.
Gallows Road Route 650	I-66 & Metro	6783 0296219	162-04A	Yes	Meet project purpose and need and the requirements of attachment 3.14a Bridge Replacements.
I-66	Tributary of Holmes Run (Culvert)	30299 0292303	–	–	Meet project purpose and need. *Double Barrel Culvert 84" dia. x 295'
I-495	Tributary of Holmes Run (Culvert)	6631 0292201	–	–	Meet project purpose and need. *Double Box Culvert 6' x 6' x 266'
I-66 WBL (Ramp H)	Tributary of Holmes Run (Culvert)	6629 0292199	–	–	Meet project purpose and need. *Double Box Culvert 5' x 5' x 191'
I-66 WBL	Holmes Run (Culvert)	6355 0292210	–	–	Meet project purpose and need. *Triple Box Culvert 6' x 8' x 323'
Ramp F to I-66 WB	Holmes Run (Culvert)	6354 0292209	–	–	Meet project purpose and need. *Triple Box Culvert 6' x 8' x 106' with 6' x 6' x 587' extension.

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66 EBL and Ramp	Tributary of Holmes Run (Culvert)	6350 0292178	—	—	Meet project purpose and need. *Double Box Culvert 6' x 5' x ?'
I-495	Holmes Run (Culvert)	6605 0292103 06605	—	—	Meet project purpose and need. *Double Box Culvert 6' x 5' x 294'
I-495	Holmes Run (Culvert)	6604 0292102	—	—	Meet project purpose and need. *Double Box Culvert 8' x 6' x 206'
I-495	Holmes Run (Culvert)	6603 0292100	—	—	Meet project purpose and need.
Pedestrian W&OD (Trail)	I-495	28658 0295024	287-67	No	Meet project purpose and need.
I-66 Ramp ES	I-495 Main, HOT & I-66 Ramps	28667 0292281	287-68	No	Meet project purpose and need.
I-66 Ramp ESH	I-495 HOT & I-66 Ramps	28677 0292287	287-69	No	Meet project purpose and need.
I-66 Ramp NWH	I-66 Ramp	28676 0292286	287-70	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 WB	495 NBL & HOT, I-66 Ramps	28666 0292280	287-71	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs

Facility Carried	Feature Intersection	Federal ID / VA Struct. No.	Bridge Plan Number	Potential Asbestos	Scope
I-66 WB	I-495 SB & Ramp I-66 ESH	28665 029-2279	287-72	No	Meet project purpose and need and the requirements of Attachment 3.14d Bridge Widening and Repairs
I-66 EB & Ramp SHE	I-495 NBL & HOT & I-66 Ramps	28664 0292278	287-73	No	Meet project purpose and need.
I-66 EB & Ramp	I-495 SB & HOT	28663 0292277	287-74	No	Meet project purpose and need.
I-66 Ramp WN	I-495 SB & HOT, Ramp & Holmes Run	28662 0292276	287-75	No	Meet project purpose and need.
Ramp B of I-495 (NB to I-66 WB)	I-66 & Metro	6598 0292065	162-09, A, B, C 162-09B (495 Express)	To be determined by Developer	Meet project purpose and need.
I-66 Ramp SWH	I-495 SB & HOT	28675 0292285	287-77	No	Meet project purpose and need.

* Based on latest Safety Inspection Report and provided for information only. Developer to verify as needed.

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.14d

Bridge Widening and Repairs Table

Attachment 3.14d Bridge Widening and Repairs Table

Facility Carried	Feature Intersected	Federal ID / VA Struct. No.	MODIFIED BRIDGE - TYPICAL SECTION	ADDITIONAL REQUIREMENT / RESTRICTIONS / NOTES
University Blvd. Route 840	I-66 & Norfolk Southern Railroad	26694 0766188	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table. See attached Overpass and Underpass Typical Sections
I-66 WBL	Bull Run	6380 0292900	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 EBL	Bull Run	6381 0292901	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 WBL	Cub Run	24993 0292010	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 EBL	Cub Run	24994 0292011	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 EBL	Compton Road Route 658	6313 0292013	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table. Existing vertical clearance = 15'-5"
I-66 WBL	Compton Road Route 658	6311 0292012	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 WBL	Stringfellow Road Route 645	6320 0292059	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 EBL	Stringfellow Road Route 645	6322 0292060	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 WBL	Fairfax County Parkway Route 286	6376 0292266	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
I-66 EBL	Fairfax County Parkway Route 286	6378 0292267	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.

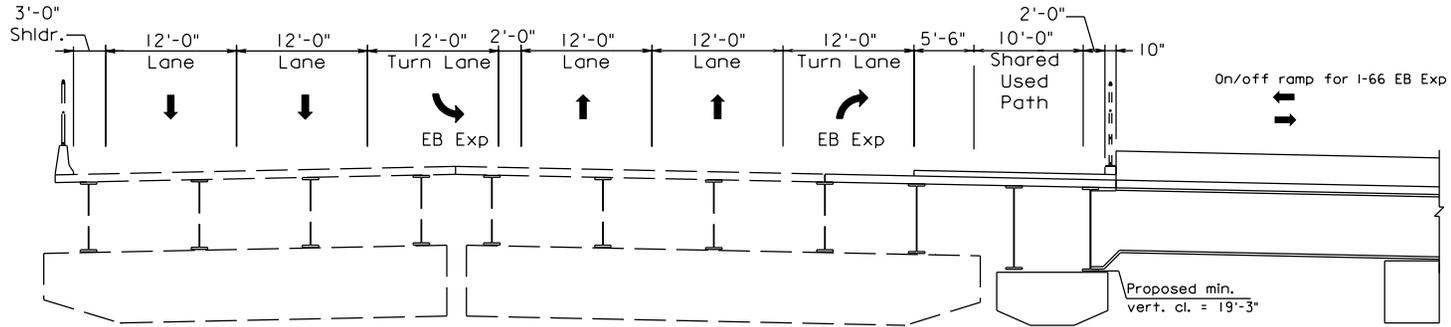
Attachment 3.14d Bridge Widening and Repairs Table

Facility Carried	Feature Intersected	Federal ID / VA Struct. No.	MODIFIED BRIDGE - TYPICAL SECTION	ADDITIONAL REQUIREMENT / RESTRICTIONS / NOTES
I-66 EB CD Road	Fairfax County Parkway Route 286	24089 0292099	Meet project purpose and need.	See Attachment 3.14e Bridge Repair Quantities Table.
				See Attachment 3.14e Bridge Repair Quantities Table.
Monument Drive Route 7969	I-66 & Route 656	7076 0296023	Meet project purpose and need.	Requirement of Section 3.14.2.A.7 in reference to elimination of longitudinal joints located outside relocated median may be waived for this bridge provided that the longitudinal joint is reconstructed to permit the installation of an expansion dam in accordance with the details shown in S&B standard drawing BEJ-3 (riding surface of joint shall be modified as necessary to provide suitable skid resistance for all types of vehicles including motorcycles). Removal of deck concrete along existing longitudinal joint, to permit the installation of the expansion dam, shall not be less than 12" horizontal (on both side of the joint for a total width of 24" plus the width of the joint), and not less than 6" vertical or 1" below the top mat of reinforcing, whichever is greater.
I-66 WB	I-495 SB and Ramp 66 ESH	28665 0292279	Meet project purpose and need.	
I-66 WB	66WNNH, 495 NB, 496 NB GP, 66WN, and 66SW	28666 0292280	Meet project purpose and need.	
Ramp 66NWH	Ramp 66WSH	28676 0292286	Meet project purpose and need.	

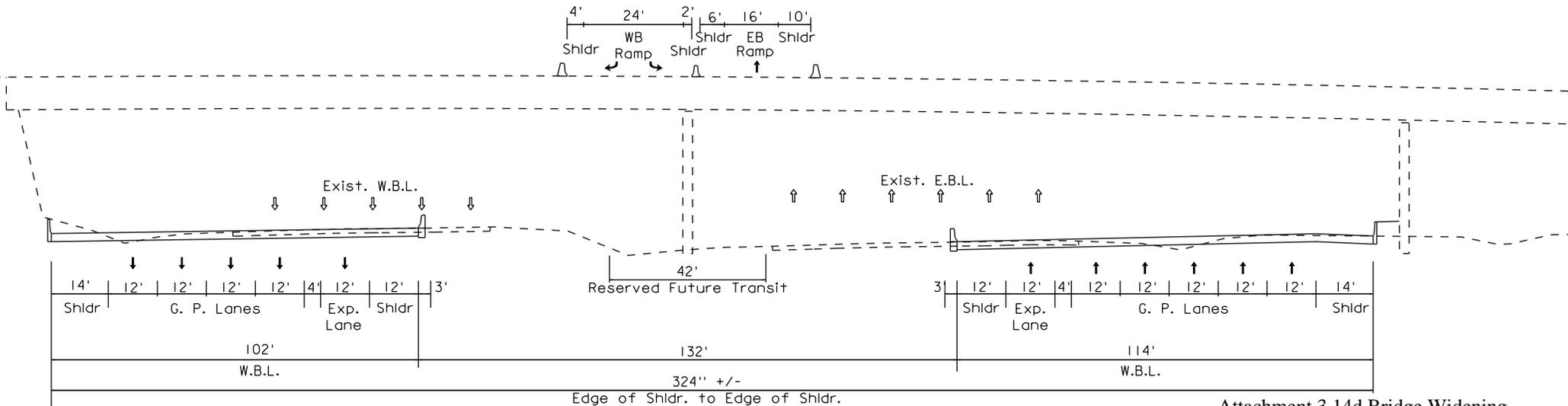
66 Express Lanes Project

Attachment 3.14d

Typical Section - University Blvd. (Rte. 840) over I-66



Proposed Facilities Under University Blvd. (Rte. 840) over I-66



Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.14e

Bridge Repair Quantities Table

**Attachment 3.14e Bridge Repair Quantities Table
 66 Express Lanes Project**

	Item Description	Specifications	Units	Segment 1						Segment 2						Total Quantities	
				University Blvd over I-66 & Norfolk Southern Railroad	I-66 WBL over Bull Run	I-66 EBL over Bull Run	I-66 WBL over Cub Run	I-66 EBL over Cub Run	I-66 WBL over Compton Road Route 658	I-66 EBL over Compton Road Route 658	I-66 WBL over Stringfellow Road Route 645	I-66 EBL over Stringfellow Road Route 645	I-66 WBL over Fairfax Cty Pkwy Route 286	I-66 EBL over Fairfax Cty Pkwy Route 286	I-66 EBL CD over Fairfax Cty Pkwy Route 286		Monument Drive over I-66 & Route 656 Phase I - widening/modifications.
Superstructure	Anchor Bolt Replacement	412	EA												10	10	
	Jacking and blocking	412	EA	18					15	15			20	20	10	10	108
	Replace Bearings	See Notes	EA						15	15			20	20	10		80
	Reset Bearings	See Notes	EA	18												0	18
	Remove and Replace Preformed Elastomeric Joint Sealer	See Notes	LF				148	148									296
	Expansion Joint Reconstruction (Very-Early-Strength Latex-Modified Concrete)	See Notes	LF		149	149			155	155	149	149	149	149	79	713.56	1,999
	Elastomeric Expansion Dam	421	LF		149	149			155	155	149	149	149	149	79	713.56	1,999
	Deck Slab Closure (Very-Early-Strength Latex-Modified Concrete)	See Notes	SY						73	73							146
	Concrete Superstructure Surface Repair	See Notes	SY		5	5	5				5	5				5	30
	Crack Repair	412	LF								318	625	120	59			1,122
	Type B Patching	412	SY								5					5	10
	Disposal of Material (Str. No's 6188, 2900, 2901, 2011, 2012, 2013, 2099, 6023)	411	LS	1	1	1		1	1	1					1	1	8
	Disposal of Material (Str. No's 2059, 2060, 6083)	411	LS								1	1				1	3
	Disposal of Material (Str. No's 2266, 2267)	411	LS										1	1			2
	Environmental Protection and Health Safety (Str. No's 6188, 2900, 2901, 2011, 2012, 2013, 2099, 6023)	411	LS	1	1	1		1	1	1					1	1	8
	Environmental Protection and Health Safety (Str. No's 2059, 2060)	411	LS								1	1					2
	Environmental Protection and Health Safety (Str. No's 2266, 2267)	411	LS										1	1			2
	Environmental Protection and Health Safety (Str. No. 6083)	411	LS													1	1
	Type A Milling (1")	See Notes	SY				2,658	2,658					1,345	1,345			8,007
	Type A Hydro-Demolition (1/2")	See Notes	SY				2,658	2,658					1,345	1,345			8,007
	Furnish (Very-Early-Strength Latex-Modified Concrete) (1 1/2"-2")	See Notes	CY				150	150					77	77			455
	Place (Very-Early-Strength Latex-Modified) Concrete Overlay	See Notes	SY				2,648	2,648					1,335	1,335			7,967
	Bridge Deck Grooving	404	SY				2,648	2,648					1,335	1,335			7,967
Prepare and Spot Coat Existing Structure	411	SF	10	184	136										4500	4,830	
Zone Coating of Existing Structures (Str. No's 2059,2060)	411, See Notes	LS								1	1					2	
Recoat Existing Structure (Str. No's 6376, 6378)	411	SF										21,148	21,148			42,296	
Clean and Paint Bearings at Abutments	See Notes	EA		31	29	0	15	27	24						88	214	
Substructure	Concrete Substructure Surface Repair	See Notes	SY		5	5	5		5	5	5	5	5	5	5	55	
	Crack Repair Type B (Epoxy Injection) - Pier	See Notes	LF		68	23										90	
	Crack Repair Type B (Epoxy Injection) - Abutment	See Notes	LF		47	45					36	66			207	400	
	Erosion Control Riprap	See Notes	TON					75								75	
Miscellaneous	Clean and Wash Abutments and Piers	See Notes	LS	1	1	1	1	1	1	1	1	1	1	1	1	13	
	Remove Vegetation	See Notes	LS	1	1	1	1		1	1	1	1			1	9	
	Repair of Embankment Erosion	See Notes	LS	1								1	1		1	4	
	Repair Gaps Between Back Walls and MSE Panels/Wingwalls	See Notes	LS				1	1			1	1				4	
	Unclog Deck Drains	See Notes	LS				1	1							1	3	
	Modify Steel Beam/Girder End	426	LS		9							4			5	18	

Bridge Repair Quantities Table Notes

The cost of preparing plan for the repairs listed in Repair Quantity Table, including any necessary engineering calculations required for the preparation of repair details shall not be measured for separate payment and shall be included in the cost of the repair items.

Replace Bearing shall consist of removing existing bridge bearings and replace with new bearings. This work shall be performed in accordance with Sections 408 and 413 of the Road and Bridge Specifications, and the following:

This work shall consist of removing existing welds, removing and disposing of existing bearing components and anchor bolts, furnishing, painting and installing new bearing assemblies (including sole plate, anchor bolts, washers and nuts), placing and inspecting new welds, cleaning and applying paint to new bearings and any disturbed areas, and providing environmental, worker and safety protection, and disposal of material.

The existing structure is designated a Type B structure in accordance with Section 411 of the Road and Bridge Specifications.

A plan for installing new anchor bolts shall be submitted to the Department for review and approval.

Beams shall be jacked a minimum distance as specified on the plans in order to relieve the load on the bearings. The cost of jacking and supporting beams shall be paid for under the pay item Jacking and Blocking.

Remove fillet weld between beam flange and sole plate, and remove the existing bearing assembly. Remove a portion of existing anchor bolts in accordance with the details.

Grind bottom of bottom flange to remove burrs. Clean bottom of flange in accordance with Road and Bridge Specifications Section 411.04(a) Method 5.

Place the new bearing assembly.

Install new anchor bolts, nuts and washers.

Fillet weld sole plate to beam flange. New welds shall be inspected by magnetic particle testing to be performed by the Contractor.

The bearing assemblies shall be painted in the shop with the system specified on the plans. The new welds and all disturbed areas shall be cleaned and coated using the Coating System specified in the plans. Sole plate shall not be painted on the surface in contact with the elastomeric bearing.

Materials and Fabrication shall be in accordance with the applicable requirements of Section 408 of the Road and Bridge Specifications. Steel in sole plates and other steel components of the

Bridge Repair Quantities Table Notes

bearings, except as noted on the details, shall be ASTM A709 Grade 36. Grout and adhesive material for anchor bolts shall be from the VDOT approved list.

Contractor shall verify heights of existing bearing assemblies prior to preparing shop drawings.

Immediately before casting the new anchor bolts in VDOT approved high-strength grout and mortar, the holes shall be thoroughly cleaned to the satisfaction of the Engineer.

Reset Bearings shall consist of resetting bearings to comply with the design parameters. A plan for resetting bearings shall be submitted to the Department for review prior to performing the work.

Each of the girders shall be jacked enough to relieve pressure from bearing, by an amount specified on the plans. The cost of jacking and supporting beams shall be paid for under the pay item Jacking and Blocking.

All new welds and areas where existing coating is disturbed shall be cleaned and re-coated using the Coating System specified on the plans.

Remove and Replace Preformed Elastomeric Joint Sealer shall consist of removing and disposing of existing joint material and replacing with new Class I joint system in accordance with Section 420 of the Road and Bridge Specifications.

Prior to placement of new sealer, existing joints shall be cleaned by abrasive blasting followed by brushing and or oil free compressed air so that it is free from dust, oil grease, or other foreign material.

Spalls greater than 1/4" from vertical face of joint shall be repaired in accordance with the details shown in Figure 1.

Expansion Joint Reconstruction (Very Early Strength Latex-Modified Concrete) shall be performed in accordance with Section 412 of the Road and Bridge Specifications and the following:

Expansion Joint Reconstruction shall consist of removing and disposing of existing concrete and any existing joint armor, repairing and replacing reinforcing steel, as may be required by the Department, preparing the contact surfaces, and furnishing and placing new concrete and reinforcing steel, in accordance with the details shown in Figure 2. Concrete used in Expansion Joint Reconstruction shall be Very-Early-Strength Latex Modified Concrete in accordance with Section 425 of the Road and Bridge Specifications

The cost of elastomeric expansion dam shall be paid for under the pay item Elastomeric Expansion Dam.

The repair quantities for expansion joint reconstruction and expansion dams provided for Monument Drive over I-66 and Random Hills Road includes expansion joints at Abutments A

Bridge Repair Quantities Table Notes

and B, Piers 1 and 3, joint between bridge and HOV ramp and a portion of the longitudinal deck joint between nose of median to nose of median. Joints to be reconstructed with the removal of deck median are to be included with the scope of work for widening the bridge and are therefore not included in the repair quantities. See notes in Attachment 3.14d Bridge Widening and Repairs Table regarding the longitudinal joint reconstruction.

Deck Slab Closure shall be in accordance with Section 412 of the Road and Bridge Specifications and the following:

Deck Slab Closure shall consist of repairing bridge decks for link slabs at piers in accordance with the details shown in the Manual of the Structure and Bridge Division Volume V Part 2 File No. 10.02-2 and including parapet concrete as required by the Department.

Unless otherwise approved by the Department, concrete for the deck slab closure shall be Very-Early-Strength Latex-Modified Concrete in accordance with Section 425 of the Road and Bridge Specifications

Concrete Superstructure Surface Repair shall be performed in accordance with the requirements of Section 412 of the Road and Bridge Specifications. The use of shotcrete will not be permitted.

Type A Milling (1''), Type A Hydro-demolition (1/2''), Furnish (Very-Early-Strength Latex-Modified) Concrete(1 1/2''-2'') and Place (Very-Early-Strength Latex-Modified) Concrete Overlay shall be completed in accordance with the requirements of Section 425 of the Road and Bridge Specifications and the following:

The depths of milling and hydro-demolition noted above were established on the basis of 2 1/2'' concrete deck cover shown on the as built plans. The Developer shall verify actual concrete deck cover using industry accepted sampling methods prior to commencement of milling operations. Milling of deck to within 3/4'' of the top of top mat of reinforcing steel shall not be permitted.

Zone Coating of Existing Structures (Str. No's 2059) shall include zone coating of the entire 2 feet of beam ends including bearings and diaphragms.

Zone Coating of Existing Structures (Str. No's 2060) shall include zone coating of the entire 2 feet of beam ends including bearings and diaphragms.

Clean and Paint Bearings at Abutments shall be completed in accordance with the requirements of Section 411 of the Road and Bridge Specifications for Zone Coating of Existing Structures.

Concrete Substructure Surface Repair shall be performed in accordance with the requirements of Section 412 of the Road and Bridge Specifications. The use of shotcrete will not be permitted

Bridge Repair Quantities Table Notes

Crack Repair Type B (Epoxy Injection) - Pier or Abutment shall be completed in accordance with the requirements of Section 412 of the Road and Bridge Specifications.

Erosion Control Riprap shall be in accordance with the requirements of Section 414 of the Road and Bridge Specifications for Dry Riprap. Unless otherwise approved by the Department, size of the dry riprap shall be in close conformity with the size of existing riprap.

Clean and Wash Abutments and Piers shall consist of the removal of debris from abutments and piers followed by pressure washing of all exposed faces of abutments and piers to remove dust and contaminants. Worker protection and collection and discharge of debris and water generated from cleaning shall be in accordance with the contract requirements and shall be included in the cost of Clean and Wash Abutments and Piers.

Remove Vegetation shall consist of removing and disposing of trees, shrubs and vegetation noted in the most recent National Bridge Inspection Standards bridge inspection report for the structure. Debris shall be disposed of in accordance with the contract requirements.

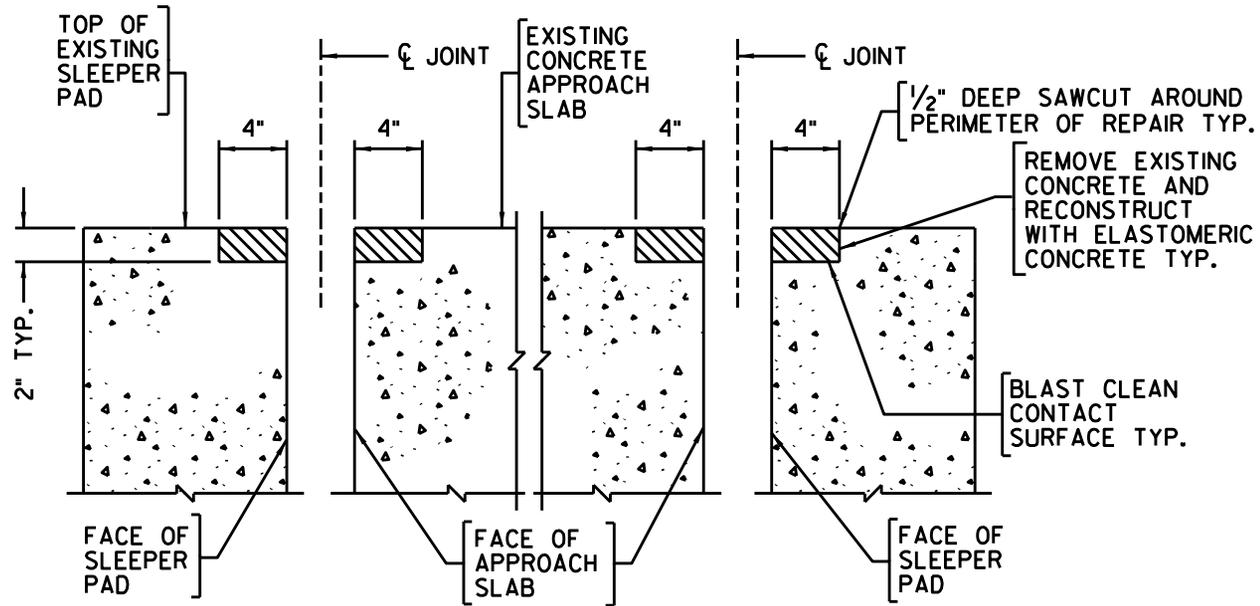
Repair of Embankment Erosion shall consist of preparing and backfilling holes, gullies and other embankment erosion as noted in the most recent National Bridge Inspection Standards bridge inspection report for the structure. Backfilling to original lines and grades shall be completed in accordance with the requirements of Section 303.04(f) and 303.04(g) of the Road and Bridge Specifications.

Repair Gaps Between Back Walls and MSE Panels/Wing Walls shall consist of evaluation and if necessary repair of gaps noted in the most recent National Bridge Inspection Standards bridge inspection report for the structure. Noted gaps shall be evaluated by the Design Consultant to determine if repairs are necessary to avoid further loss of functionality for the remaining life of the structure, as defined by Contract handback requirements. Details for the repair shall be developed by the Design Consultant with review and approval by the Department.

Unclog Deck Drains shall consist of unclogging, cleaning and removal of debris from bridge drainage system. Worker protection and the collection and discharge of debris and water generated from cleaning shall be in accordance with contract requirements and shall be included in the cost of Unclog Deck Drains.

Attachment 3.14e

Bridge Repair Quantities Table Notes



Attachment 3.14e Bridge Repair
Quantities Table

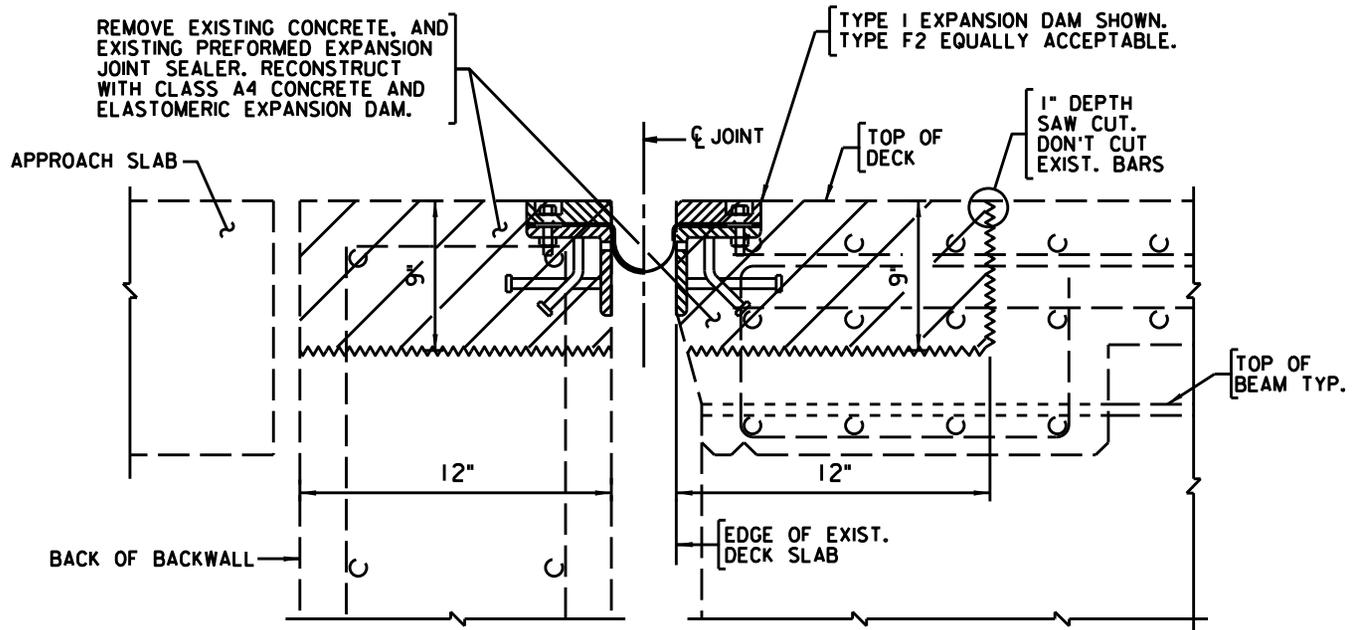
NOTES:

1. RECONSTRUCTION LIMITS SHOWN ARE FOR ELASTOMERIC CONCRETE SYSTEM.

FIGURE 1 - SECTION THROUGH SLEEPER
PADS AND APPROACH SLABS

Attachment 3.14e

Bridge Repair Quantities Table Notes



NOTES:

1. EXISTING REINFORCING STEEL TO BE CLEANED AND INCORPORATED INTO NEW CONCRETE.

66 Express Lanes

Exhibit C

Draft Technical Requirements

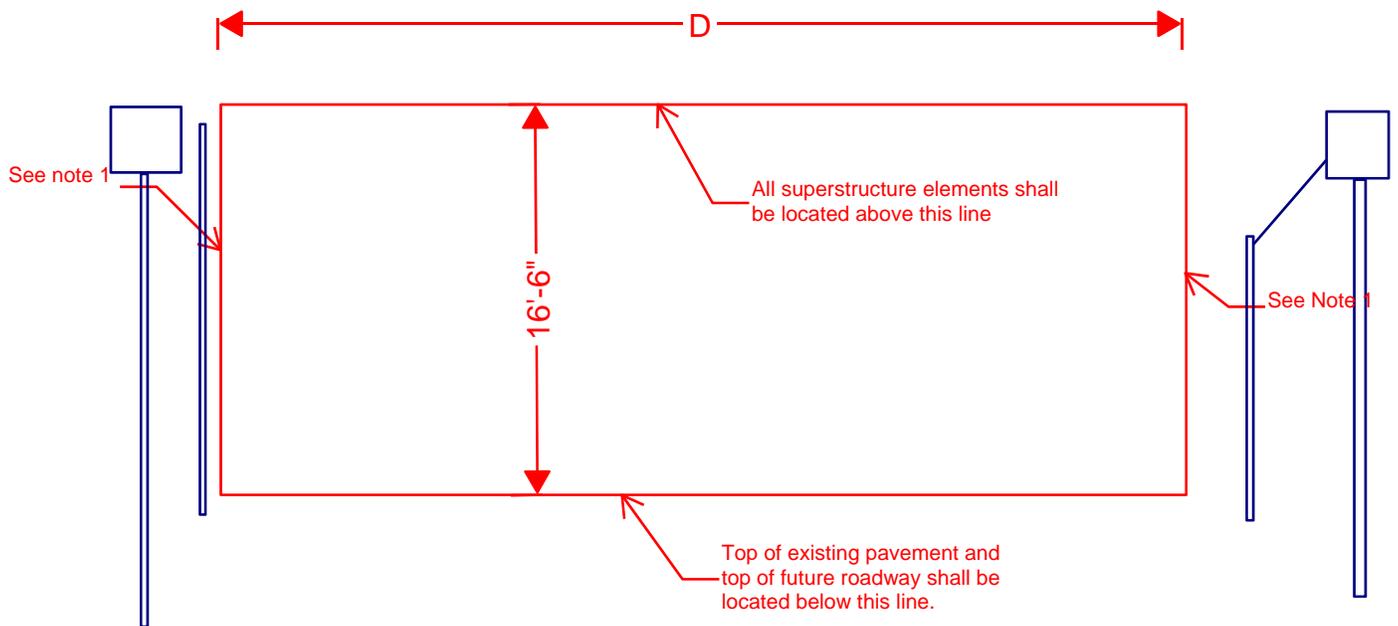
Attachment 3.14f

New Bridges -

Additional Requirements

Notes:

1. All abutment elements, including piling, walls (MSE, Soil Nail, etc.) shall be located behind this line (i.e. outside clearance box).
2. Bridge piers may be located within clearance box provided that such piers locations are coordinated with roadway designer to provide required horizontal clearance to edge of existing / future roadways, other facilities including any existing or proposed paths.
3. Location of clearance box in reference to centerline/baseline of facility intersected shall be coordinated with and approved by the Department to maximize flexibility for expansion of facilities intersected.



PROPOSED BRIDGE CLEARANCE BOX

Proposed Bridges:

1. Proposed I-66 WBL CD over Route 234 (Sudley Road): $D = 190$ ft.
2. Proposed I-66 EBL CD over Route 645 (Stringfellow Road): $D = 121.33$ ft.

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.14g

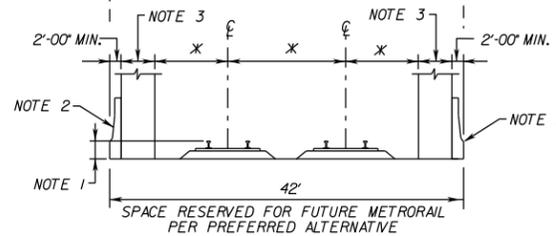
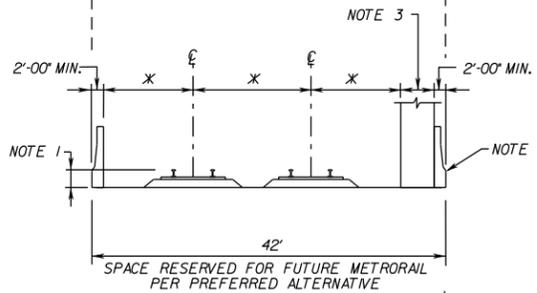
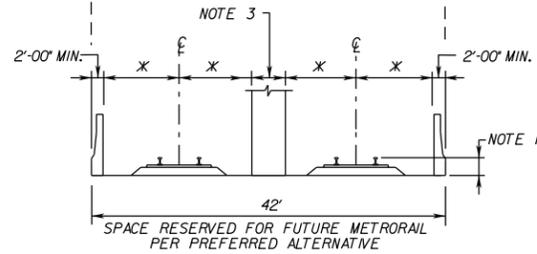
Criteria for Placement of Bridge Piers and Walls within Limits of Space Reserved for Future Metrorail

Execution Version
 Technical Requirements

BRIDGE PIER OR OTHER STRUCTURES
 AS REQUIRED, LOCATIONS TO BE
 DETERMINED DURING FINAL DESIGN
 (SEE NOTE 3)

WESTBOUND

EASTBOUND

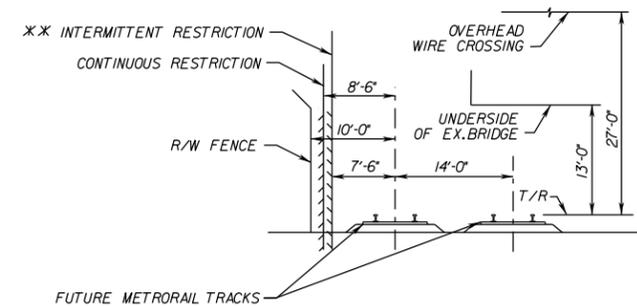


* DIMENSION SHALL MEET WMATA MINIMUM CLEARANCES FOR BALLASTED TRACK.

** AS DIRECTED BY WMATA

NOTES:

1. ASSUME TRACK TOP OF RAIL IS APPROXIMATELY 4'-0" ABOVE THE ADJACENT PAVEMENT ELEVATION AT THE INTERFACE WITH THE BARRIER FOR REPRESENTATIVE CROSS-SECTIONS.
2. BPPS-1 OR BPPS-3 AS APPLICABLE (IF REQUIRED).
3. AT A MINIMUM, PIER DIMENSIONS SHALL MEET THE AREMA (AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION) MANUAL FOR RAILWAY ENGINEERING REQUIREMENTS FOR A PIER OF HEAVY CONSTRUCTION INCLUDING CRASH PROTECTION.
4. SECTIONS ON THIS PAGE ONLY APPLY TO CROSS-SECTIONS FOR THE FUTURE EXTENSION OF THE METRORAIL ORANGE LINE WEST OF THE VIENNA STATION.
5. DEVELOPER SHALL DEMONSTRATE THE 42' SPACE RESERVATION ALLOWS MEETING ALTERNATING LEFT, CENTER, OR RIGHT SIDE OFFSETS TO INTERMITTENT OR CONTINUOUS RESTRICTIONS INCLUDING CONFORMANCE WITH ALL WMATA DESIGN CRITERIA FOR HORIZONTAL ALIGNMENT TRANSITIONS (TAPERS) FOR DESIRED RAIL OPERATING SPEEDS.



FUTURE METRORAIL
 MINIMUM CLEARANCES
 TANGENT BALLASTED TRACK
 (WMATA MANUAL OF DESIGN CRITERIA)

CRITERIA FOR PLACEMENT OF BRIDGE PIERS AND WALLS
 WITHIN LIMITS OF SPACE RESERVED FOR FUTURE METRO

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 3.19

Security Requirements for Developer Operated Critical Infrastructure Facilities and Structures

Security Requirements for Developer Operated Critical Infrastructure Facilities and Structures

The Department and the Developer will mutually agree during the Construction Period to the requirements of the Security Management Systems (SMS) and protocols which may include requirements and/or protocols listed below. All costs and funding associated with these requirements and protocols will be mutually agreed between the Department and the Developer.

Definitions

1. “SMS” - Throughout this document the term Security Management Systems (“SMS”) is intended to include all systems and equipment that directly and indirectly relate to the physical security of the facility, structure or compound the facility or structure is located on. Examples include but are not limited to Physical Access Control Systems (PACS), Cipher locks, security surveillance systems (CCTV), intrusion detection, security lighting, security related fiber optic and wireless communications systems and all associated hardware, security fencing, gates, gate operators, intercommunications, bollards and other forms of security systems and technology. SMS does not include standard door and/or office door knob locks and keys.

Documents

The Developer shall adhere to the below listed policies, procedures, or laws pertaining to Criminal History Records Checks, Critical Infrastructure Information / Sensitive Security Information (CII/SSI), Freedom of Information Act requests and Records Retention pertaining to security.

1. The Department’s Criminal History Records Check Policy (DPM 1-25)
2. The Department’s Freedom of Information Act Policy (DPM 1-5)
3. The Department’s CII/SSI Policy and Guide
4. Commonwealth of Virginia Records Retention Schedule(s) 108 and/or other applicable

Construction Period

1. The Department shall review and approve of all plans containing SMS components to determine the extent and type of needed SMS systems and potentially specific placement of components of the SMS. The Department shall review the technical specifications and/or equipment to be used in order to ensure compatibility, interoperability, and integration with current systems utilized by the Developer and the Department.
2. In general, through layered security, the following types (not all inclusive) of SMS will need to be incorporated into the facility or structure to mitigate common security vulnerabilities:
 - a. Perimeter intrusion detection
 - b. Vehicular and pedestrian access control (exterior)
 - c. Access control (interior)

- d. Security camera system (exterior & interior)
 - e. Security Lighting
 - f. Security Network
 - g. Interoperability with existing Department Security systems
 - h. Other as determined necessary
3. The Developer shall be responsible for any and all onsite security and security planning.

Operations Period

1. The Department shall have compliance oversight authority in order to ensure all SMS equipment, components and related security protocols are maintained at the Express Operations Center.
2. The Developer shall allow the Department remote viewing and monitoring access to all security surveillance camera systems (CCTV) and shall allow the Department to extend this remote viewing capability to Department security consultants or local, state and Federal security partners who perform Homeland Security initiatives such as DHS, JTTF, USCG, VSP, etc.
3. The Developer shall ensure all security surveillance camera systems (CCTV) operating platforms remain interoperable with security surveillance camera systems (CCTV) operating platforms utilized by the Department.
4. The Developer shall be responsible for maintaining all SMS in accordance with manufacturer's recommendations and industry best practices, and will ensure all SMS is maintained in a functional and operational capacity.
5. The Developer shall maintain a SMS preventative and corrective maintenance program, to include records documentation of all preventative and corrective maintenance activities.
6. The Developer shall maintain and be responsible for all SMS monitoring and all associated SMS administrative functions.
7. The Developer shall provide the Department a detailed inventory of all SMS installed to include location, SMS equipment documentation, including but not limited to as-builts, installation manuals, user manuals, programming manuals, training manuals, warranty documentation, etc.
8. The Developer shall not remove, relocate, change, alter, disconnect or impede any piece of SMS equipment without the Department's prior review and approval, unless it's a direct replace in kind or upgrade.
9. The Developer shall utilize, operate and incorporate all SMS into Developer's daily operational protocols and procedures.
10. The Developer shall ensure all staff is adequately trained in the use and operations of SMS equipment and protocols.

11. The Developer shall designate an employee to serve as an onsite security representative. This representative shall be the Point of Contact (POC) with the Department responsible for coordinating security initiatives and programs with the Department.
12. The Developer shall notify the Department of all security requests (i.e. requests for security information, assessments, and tours, to include foreign visitor's tour requests, etc).
13. All foreign visitor tour/site visit requests will be forward to the Department for processing in accordance with FHWA's Office of International Programs protocols.
14. The Developer shall not release any security related information to include SMS information without the consent of the Department. FOIA requests for security information will be handled in accordance with the Department's FOIA policy and procedures; additionally the Developer shall notify the Department of all security related FOIA requests.
15. The Developer will notify the appropriate VDOT Traffic Operations Center of all suspicious activity, or criminal activity in addition to reporting to local authorities having jurisdiction.
16. The Developer shall provide the Department, Department consultants or Federal security partners access to Developer operated Operations Center(s), SMS equipment, components, systems and SMS maintenance records for the purpose of completing SMS compliance reviews to ensure SMS is being maintained in a functional and operational capacity. Adequate notice shall be given to Developer, prior to any compliance review visit.
17. The Developer shall support local, state and federal security initiatives involving the Express Operations Center and will allow deployment of equipment which supports security and or anti-terrorism operations, on the Express Operations Center at the discretion of the Department.
18. The Developer in accordance with the Department's Criminal History Records Check Policy (DPM 1-25) shall ensure all persons to include the Department, contractor(s) and or subcontractor personnel working at, or having unrestricted access to the Express Operations Center, or having access to designated CII/SSI information have been vetted through the Department's Criminal History Records Check process.
19. The Department reserves the right to require the Department's Criminal History Records Check on any Department, contractor and or subcontractor personnel.
20. The Developer shall ensure all documents which are exempt from the FOIA under COV §2.2-3705.2., are marked in accordance with the Department's CII/SSI policy. Developer shall consult the Department for any CII/SSI marking or handling guidance.
21. The Developer shall develop and incorporate business continuity, resiliency, and emergency action planning as an element of their planning and operations at the Express Operations Center and 66 Express Lanes Project. It is the Developer's responsibility, during the Construction Period and Operations Period to plan, develop, maintain and test these plans in accordance with Commonwealth of Virginia and federal requirements. The Department will have compliance oversight authority to verify that these elements do in fact exist, that they are maintained and tested according to industry best practices and that

the level of preparedness will reasonably assure rapid recovery at minimum and continuous operation at best.

22. The Developer shall ensure that all voice communications systems meet FCC requirements and are of such nature that will foster effective interoperability.
23. The Developer shall ensure and document all employees, to include contractors working in an employee position, have completed the State's Terrorism and Security Awareness Orientation training or state equivalent versions. The Developer shall initiate and maintain the same level of NIMS competency as equivalent Department staff positions.
24. The Developer shall work directly with the Department to implement and maintain all security, NIMS, Emergency Response, Incident Management, programs, policies and procedures which may not have been addressed in all other associated contractual documents pertaining to the Express Operations Center and 66 Express Lanes Project, in order to maintain the same level of security, NIMS, and Emergency Response, Incident Management which the Department maintains.
25. The Department's Criminal History Records Check Policy (DPM 1-25) shall be followed, which may require background checks for those entities placing equipment on designated Critical Infrastructure facilities and structures or the right of way thereof, and therefore needing access to said equipment.

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 4.3

Bridge Maintenance Responsibilities

Execution Version
 Technical Requirements

Segment No.	Proposed Option	Bridge Location Identification	Federal Structure ID No.	VA Structure No.	Current Existing Plan No's	Maintenance Responsibility	Miscellaneous Notes	
1	Phase 1	University Blvd (Rte. 840) over I-66 & NSRR	26694	076-6188	285-18	Shared Facility	Existing bridge widening (with direct access ramps)	
		Prince William Parkway EBL (Rte. 234 Bypass) over I-66	24787	076-1052	271-72	VDOT	Existing bridge to remain	
		Prince William Parkway WBL (Rte. 234 Bypass) over I-66	24788	076-1053	271-72	VDOT	Existing bridge to remain	
		Groveton Road over I-66	25960	076-6082	280-04	VDOT	Existing bridge to remain	
	Phase 1	Park and Ride Lot (Balls Ford Road) Direct Access Bridge over I-66 EBL	TBD	TBD	TBD	66 Express	Proposed new bridge (with direct access ramps)	
	Phase 1	I-66 CD WBL over Sudley Road (Rte. 234 Business)	TBD	TBD	TBD	VDOT	Proposed new bridge	
	Phase 1	I-66 GP and Express WBL over Sudley Road (Rte. 234 Business)	14202	076-2000	136-21, A-D	Shared Facility	Existing bridge to remain	
	Phase 1	I-66 GP and Express EBL over Sudley Road (Rte. 234 Business)	28305	076-2001	136-21, A-D	Shared Facility	Existing bridge to remain	
	Phase 1	I-66 GP and Express WBL over Bull Run	6380	029-2900	136-22, A-C	Shared Facility	Existing mainline bridge widening	
	Phase 1	I-66 GP and Express EBL over Bull Run	6381	029-2901	136-22, A-C	Shared Facility	Existing mainline bridge widening	
	Phase 1	Bull Run Drive (Rte. 2548) over I-66	6959	029-6213	136-16, A	VDOT	Existing bridge replaced	
	Phase 1	I-66 GP and Express WBL over Cub Run	24993	029-2010	272-29	Shared Facility	Existing mainline bridge widening	
	Phase 1	I-66 GP and Express EBL over Cub Run	24994	029-2011	272-29	Shared Facility	Existing mainline bridge widening	
	Phase 1	I-66 GP and Express WBL over Compton Road	6311	029-2012	136-19, A-C	Shared Facility	Existing mainline bridge widening	
	Phase 1	I-66 GP and Express EBL over Compton Road	6313	029-2013	136-19, A-C	Shared Facility	Existing mainline bridge widening	
	Phase 1	I-66 GP and Express WBL over Lee Highway (Rte. 29) - Centreville	6315	029-2019	148-07, A-F	Shared Facility	Existing bridge to remain	
	Phase 1	I-66 GP and Express EBL over Lee Highway (Rte. 29) - Centreville	6317	029-2020	148-07, A-F	Shared Facility	Existing bridge to remain	
	Phase 1	Rte. 28 SBL Ramp Flyover to I-66 Express Lanes WBL	TBD	TBD	TBD	66 Express	Proposed new bridge	
	Phase 1	Braddock Rd (Rte. 620) / Walney Rd (Rte. 657) over Sully Rd (Rte. 28) with access to Rte. 28	TBD	TBD	TBD	VDOT	Proposed new bridge	
	Phase 1	Sully Road (Rte. 28) GP SB over I-66	TBD	029-1029	TBD	VDOT	Existing bridge replaced	
	Phase 1	Sully Road (Rte. 28) GP SB Direct Access Flyover to I-66 Express Lanes EBL	TBD	TBD	TBD	66 Express	Proposed new bridge	
	Phase 1	Sully Road (Rte. 28) GP NB over I-66	TBD	TBD	TBD	VDOT	Existing bridge replaced	
	Phase 1	I-66 Express EBL Direct Access Flyover to Sully Road (Rte. 28) GP NB	TBD	TBD	TBD	66 Express	Proposed new bridge	
	Phase 1	I-66 Express WBL Direct Access Flyover to Sully Road (Rte. 28) GP NB	TBD	TBD	TBD	66 Express	Proposed new bridge	
	Phase 1	Sully Road (Rte. 28) NB GP Direct Access Flyover to I-66 Express Lanes EBL	TBD	TBD	TBD	66 Express	Proposed new bridge	
	Phase 1	Poplar Tree Road over Sully Road (Rte. 28)	TBD	TBD	TBD	VDOT	Proposed new bridge	
	2	Phase 1	I-66 Express WBL Flyover to I-66 GP WBL (to Sully Road - Rte. 28)	TBD	TBD	TBD	66 Express	Proposed new bridge
		Phase 1	I-66 Express EBL Flyover to I-66 GP EBL (to Fairfax County Parkway - Rte. 286)	TBD	TBD	TBD	66 Express	Proposed new bridge
Phase 1		I-66 GP and Express WBL over Stringfellow Road (Rte. 645)	6320	029-2059	271-09	Shared Facility	Existing mainline bridge widening	
Phase 1		I-66 GP and Express EBL over Stringfellow Road (Rte. 645)	6322	029-2060	271-09	Shared Facility	Existing mainline bridge widening	
Phase 1		I-66 GP and Express CD Road EBL over Stringfellow (Rte. 645)	TBD	TBD	TBD	Shared Facility	Proposed new bridge	
Phase 1		I-66 Express WBL Flyover to Stringfellow Road Ramp	TBD	TBD	TBD	66 Express	Proposed new bridge	
		I-66 CD Road WBL over Fairfax County Parkway (Rte. 286)	24090	292091	269-55	VDOT	Existing bridge to remain	
Phase 1		I-66 GP and Express WBL over Fairfax County Parkway (Rte. 286)	6376	029-2266	268-21, A	Shared Facility	Existing mainline bridge widening	
Phase 1		I-66 GP and Express EBL over Fairfax County Parkway (Rte. 286)	6378	029-2267	268-21, A	Shared Facility	Existing mainline bridge widening	
Phase 1		I-66 CD Road EBL over Fairfax County Parkway (Rte. 286)	24089	292099	269-56	VDOT	CD road bridge widening	
		West Ox Road (Rte. 608) over I-66	6667	029-6229	268-25	VDOT	Existing bridge to remain	
Phase 1		Monument Drive over I-66	7076	029-6023	268-18, A	VDOT	Existing bridge widening (mod. for direct access ramps)	
Phase 1		Lee Jackson Memorial Highway (Rte. 50) EBL over I-66 with Direct Access to I-66 Express EBL	6299	029-1121	148-09, A	Shared Facility	Existing bridge replaced	
Phase 1		Lee Jackson Memorial Highway (Rte. 50) WBL over I-66 EB Ramp B	6301	029-2080	148-11	VDOT	Existing bridge replaced	
Phase 1		Lee Jackson Memorial Highway (Rte. 50) WBL over I-66 with Direct Access from I-66 Express WBL	6297	029-1120	148-10, A	Shared Facility	Existing bridge replaced	
Phase 1		Lee Jackson Memorial Highway (Rte. 50) WBL Ramp over Rte. 50 EBL to I-66 GP WBL	TBD	TBD	NA	VDOT	Proposed new bridge	
		Lee Jackson Memorial Highway (Rte. 50) WBL Flyover Rte. 50 EBL and Ramp to Fair Oaks Mall	6176	029-1124	259-73	Fair Oaks Mall	Existing bridge to remain	
Phase 1		Waples Mill Road (Rte. 665) over I-66	6817	029-6228	148-14, A	VDOT	Existing bridge replaced	
Phase 1		Jermantown Road (Rte. 655) over I-66	6798	029-6223	148-05, A	VDOT	Existing bridge replaced	
		Chain Bridge Road (Rte. 123) SBL over Ramp A	6459	029-1110	148-13, A, B	VDOT	Existing bridge to remain	

Execution Version
 Technical Requirements

Segment No.	Proposed Option	Bridge Location Identification	Federal Structure ID No.	VA Structure No.	Current Existing Plan No's	Maintenance Responsibility	Miscellaneous Notes
3		Chain Bridge Road (Rte. 123) NBL over Ramp A	6461	029-1111	148-13, A, B	VDOT	Existing bridge to remain
	Phase 1	Chain Bridge Road (Rte. 123) over I-66 with Direct Access to Express Lanes	TBD	TBD	TBD	Shared Facility	Existing bridge replaced (with direct access ramps)
		Blake Lane (Rte. 655) over I-66 & Metro Facility	6796	029-6218	264-16	VDOT	Existing bridge to remain
	Phase 1	Vaden Drive over I-66 & Metro Facility with Direct Access to I-66 Express Lanes	6198	029-2262	260-81, A	Shared Facility	Existing bridge replaced
	Phase 1	Vaden Drive Direct Access Express Lanes Ramp Structure	TBD	TBD	TBD	66 Express	Proposed new bridge
	Phase 1	Metro Pedestrian Bridge To Vienna Station North	TBD	TBD	TBD	WMATA	Existing bridge replaced
		Metro Pedestrian Bridge To Vienna Station South	TBD	TBD	TBD	WMATA	Existing bridge to remain
	Phase 1	Nutley Street (Rte.243) NBL over I-66 & Metro Facility	TBD	TBD	TBD	VDOT	Existing bridge replaced
	Phase 1	Nutley Street (Rte.243) SBL over I-66 & Metro Facility	TBD	TBD	TBD	VDOT	Proposed new bridge
	Phase 1	Cedar Lane (Rte. 698) over I-66 & Metro Facility	6865	029-6220	162-03	VDOT	Existing bridge replaced
	Phase 1	I-66 GP EBL Flyover to I-66 Express EBL	TBD	TBD	TBD	66 Express	Proposed new bridge
	Phase 1	Metro Pedestrian Bridge To Dunn Loring Station	TBD	TBD	TBD	WMATA	Existing bridge replaced
	Phase 1	Gallows Road (Rte. 650) over I-66 & Metro Facility	6783	029-6219	162-04A	VDOT	Existing bridge replaced
	Phase 1	I-66 GP and Express WBL over I-495 GP and Express SBL	28665	029-2279	287-72	Shared Facility	Existing mainline bridge widening
	Phase 1	I-66 GP and Express WBL over I-495 GP and Express NBL	28666	029-2280	287-71	Shared Facility	Existing mainline bridge widening
	Phase 1	I-495 Express SBL over Ramp to I-66 GP and Express WBL	28676	029-2286	287-70	66 Express	Existing ramp bridge widening
	Phase 1	I-495 Express SBL Ramp Flyover I-66 WBL to I-66 Express WBL	TBD	TBD	TBD	66 Express	Proposed new bridge
	Phase 1	I-495 Express NBL Flyover I-495 Express and GP NBL to Flyover Ramp to I-66 GP WBL	TBD	TBD	TBD	66 Express	Proposed new bridge
	Phase 1	I-495 GP and Express NBL Flyover I-495 and Metro Facility to I-66 GP WBL	TBD	TBD	TBD	Shared Facility	Proposed new bridge
		I-495 Express NBL Flyover I-495 GP and Express SBL to I-66 Express WBL	28675	029-2285	287-77	66 Express	Existing bridge to remain
		I-495 Express NBL Flyover I-66 GP, Express and Metro Facility EBL to I-66 Express WBL	6598	029-2065	162-09A, B, C	66 Express	Existing bridge to remain
	Phase 1	I-495 GP NBL Ramp Flyover I-66 WBL GP and Express to I-66 Express WBL	TBD	TBD	TBD	66 Express	Proposed new bridge
		I-66 GP EBL Flyover I-495 to I-495 GP NBL	28662	029-2276	287-75	VDOT	Existing bridge to remain
		I-66 GP and Express EBL over I-495 GP and Express SBL	28663	029-2277	287-74	Shared Facility	Existing bridge to remain
	I-66 GP and Express EBL over I-495 GP and Express NBL	28664	029-2278	287-73	Shared Facility	Existing bridge to remain	
Phase 1	I-66 Express EBL Flyover I-66 WBL to Ramp to I-495 GP SBL	TBD	TBD	TBD	66 Express	Proposed new bridge	
	I-66 GP WBL and I-66 Express EBL Ramp Flyover I-495 to I-495 GP SBL	28667	029-2281	287-68	VDOT	Existing bridge to remain	
	I-66 GP WBL Ramp Flyover I-495 GP and Express NBL to I-495 Express SBL	28677	029-2287	287-69	VDOT	Existing bridge to remain	

Total - VDOT Maintained	27	New bridges (including replaced bridges)	37
Total - Shared Facility Maintained	25	Bridge widenings (including DAR modifications)	16
Total - 66 Express Maintained	18	Existing bridge to remain	21
Total - WMATA Maintained	3		
Private Owner	1		
Total Bridges	74		

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 4.5

Performance Requirements Baseline Tables

The Performance Requirements are stated in the Performance Requirements Baseline Tables.

An Asset meets a Performance Requirement provided that, where applicable:

- the requirement(s) stated in Table 4.5a under Performance Requirement are fulfilled;
- the Asset fulfils the “Asset Condition Criteria” set forth in the third column of Table 4.5a to the extent required in the fourth column of Table 4.5a (entitled “Target”) as a percentage of the total measurements performed with respect to each criterion; and
- the requirements(s) stated in Table 4.5b under Outcome (second column) are fulfilled;
- the Asset fulfils the “Ordinary Maintenance Criteria” set forth in the fourth column of Table 4.5b to the extent required in the third column of Table 4.5b (entitled “Minimum”) as a percentage of the total measurements performed with respect to each criterion; and
- the Developer meets the “Timeliness Requirements” set forth in the fourth column of Table 4.5b of the Technical Requirements, subject to environmental conditions and ability to perform maintenance or as mutually agreed in the Life Cycle Maintenance Plan.

The Performance Baseline Tables are reviewed and updated following Project Completion as described in Section 4.5 of the Technical Requirements.

1 Asset Condition Performance Requirements

Table 4.5a: Asset Condition Performance Requirements Baseline Table			
Asset	Performance Requirement	Asset Condition Criteria and Timeliness Requirements	Target
Pavement	Roadways have a smooth and quiet surface course with adequate skid resistance and free from defects. All measurement methods and application for the HOT lanes based on the asset condition reports and a full 5-year period maintenance plan prepared will be considered in determination of performance requirements for Pavement.	The methodology of data collection, quality assurance of data, derivation of condition measures, and the use of pavement condition data to assess pavement deficiencies, and develop the 5-year period maintenance plan shall be consistent with the latest VDOT roadway condition assessment and maintenance practice guidelines(1). The condition data shall be compatible with VDOT Pavement Manager System database. (1) The latest practice guidelines and related standards can be found in the "State of the Pavement" - an annual statewide pavement condition report issued by VDOT Maintenance Division.	NA
		Maximum Rut depth 3/4" <u>Timeliness Requirement</u> Pavement rut depth is brought below maximum within 3 months of the measurement of failure to meet the target.	100%
		International Roughness Index Rating (IRI) shall be 170 or less <u>Timeliness Requirement</u> IRI measurements applicable to each 0.01-mile section for each designated lane. IRI is brought below Target within 3 months of the measurement of failure to meet the target.	100%
		<u>Asset Condition Criteria</u> Achieve a minimum of 70 on the Critical Condition Index (CCI) ⁽¹⁾ CCI measurements applicable to each 0.1-mile section for each designated lane. CCI	100%

Table 4.5a: Asset Condition Performance Requirements Baseline Table			
Asset	Performance Requirement	Asset Condition Criteria and Timeliness Requirements	Target
		is calculated as the lower of Load Rated Distress Rating (LDR) and Non Load Rated Distress Rating (NDR) <u>Timeliness Requirement</u> CCI is brought above minimum within 6 months of measurement of failure to meet target.	
Paved Shoulder		Condition assessment of the paved shoulder will be subjective, simply for safety, convenience, and efficiency.	100%
Bridges and Bridge Class Culverts	Bridges and Bridge Class Culverts are safe, fully functional, and structurally sound.	<u>Asset Condition Criteria</u> Maintain a general condition rating for Decks (Item 58), Superstructures (Item 59), Substructures (Item 60), Channels and Channel Protections (Item 61), and Bridge Class Culverts (Item 62) at a level of 5 "Fair Condition" or better, as defined in the <i>FHWA</i> Recording and Coding Guide for Structure Inventory and Appraisal of the Nation's Bridges. Maintain the following bridge element state condition as defined in the VDOT Element Data Collection Manual for: 1. Coated Steel/Metal Elements (Paint) at a condition state 2 or higher. 2. Expansion Joints at a condition state of 1. 3. Bearings at a condition state of 2 or higher. Perform inspections and assessment in accordance with the requirements of federal National Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23CFR650 Subpart C - National Bridge Inspection Standards and IIM-S&B 27- Bridge Safety Inspections and IIM-S&B-86 -Load Rating and Posting of Structures (Bridges and	100%

Table 4.5a: Asset Condition Performance Requirements Baseline Table			
Asset	Performance Requirement	Asset Condition Criteria and Timeliness Requirements	Target
		<p>Culverts). All inspection reports and load ratings shall be submitted to the Department.</p> <p>Bridge deck ride quality shall conform to “Localized Roughness” criteria for pavement (i.e., Continuous IRI ≤ 300 in/mi per 0.01-mile segment length).</p> <p>There are no Structurally Deficient Bridges⁽²⁾ or Bridge Class Culverts.</p> <p>There are no weight restricted bridges⁽³⁾ or Bridge Class Culverts.</p> <p><u>Timeliness Requirements</u></p> <p>Structure condition ratings are brought above minimum performance levels within 6 months of measurement of failure to meet minimum.</p> <p>Localized roughness is brought below maximum within 6 months of measurement of failure to meet minimum.</p>	
Traffic Control Device Structures	Traffic Control Device Structures are safe, fully functional, and structurally sound.	<p><u>Asset Condition Criteria</u></p> <p>Maintain a general condition rating of Traffic Control Devices at a level of 6/“Satisfactory Condition” or better (the term “Satisfactory” shall be a condition similar to that as described in Items 58 through 62 in the <i>FHWA Recording and Coding Guide for Structure Inventory and Appraisal of the Nation’s Bridges</i>). Traffic control device structures include: Overhead sign structures, cantilever sign structures, butterfly sign structures, toll gantries, high mast lighting poles, offset lighting poles, conventional lighting poles, camera poles and traffic signal structures.</p> <p>Perform inspections and assessment in accordance with the requirements IIM-S&B-82-Traffic Structures.</p>	100%

Table 4.5a: Asset Condition Performance Requirements Baseline Table			
Asset	Performance Requirement	Asset Condition Criteria and Timeliness Requirements	Target
		<p><u>Timeliness Requirements</u> Structure condition ratings are brought above minimum performance levels within 6 months of measurement of failure to meet minimum.</p>	
Drainage	Drainage system is effective at ensuring travel way is free from water such that the water does not present a hazard by virtue of its location, size, and depth	<p><u>Asset Condition Criteria</u> Length of roadway with visual inspection confirming no hazardous free standing water</p> <p><u>Timeliness Requirements</u> Conditions giving rise to hazardous free standing water are rectified within 3 months of discovery.</p>	90%
Electrical supply	Electrical supply, feeder pillars, cabinets, switches and fittings are electronically, mechanically and structurally sound and functioning	<p><u>Asset Condition Criteria</u> Percentage of pillars, cabinets and fittings confirmed sound and functioning by visual inspection</p> <p><u>Timeliness Requirements</u> Instances of unsound and non-functioning equipment are rectified within three months of discovery or as agreed in the Life Cycle Maintenance Plan.</p>	90%
Hazardous materials / spillage	Control of hazardous materials shall be in accordance with Chapter 13, NFPA 502	<p><u>Asset Condition Criteria</u> Incident reports showing compliance</p> <p><u>Timeliness Requirements</u> Failures to comply with Chapter 13, NFPA 502 are investigated and revised procedures put in place within 1 month of completion of investigation.</p>	100%
Structural assessment	Evaluate structural damage to structures and liaise with emergency services to ensure safe working in clearing incidents	<p><u>Asset Condition Criteria</u> Inspections and surveys as required by incident that are correctly reported.</p> <p><u>Timeliness Requirement</u> Failures to evaluate damage to structures and to</p>	100%

Table 4.5a: Asset Condition Performance Requirements Baseline Table			
Asset	Performance Requirement	Asset Condition Criteria and Timeliness Requirements	Target
		assist emergency services with clearing of incidents are investigated and revised procedures put in place within 1 month of completion of investigation.	

- (1) The latest practice guidelines and related standards can be found in the “State of the Pavement” – an annual renewable pavement condition report issued by the VDOT Maintenance Division

 I-66 will utilize the prevailing methods of pavement assessment the Department employs at a given time in the future and each 0.1-mile segment of pavement shall be maintained in at least the “Good” condition range for the prevailing method. The year 2015 Department condition assessment method for the pavement utilizes a continuous digital imaging and automated crack detection technology. The surface condition of only one travel lane in each direction along the 66 Express Lanes will be inspected annually. The assessment data will then be processed and characterized into a series of rating indices to represent the overall condition of the pavement and the basis for the maintenance and rehabilitation schedules.

 Where existing pavement remains as part of the 66 Express Lanes, the Department’s maintenance history and assumptions in regards to conditions, including the information documented in the will be the basis for the I-66 reporting in the future
- (2) Structurally Deficient: A bridge or a bridge class culvert is deemed structurally deficient if any of its NBI general condition rating (deck, superstructure, substructure, or culvert) is 4 or less, or one of two appraisal ratings (structural condition or waterway adequacy) is 2 or less.
- (3) Weight Restricted: When the load carrying capacity of a structure as a result of a structural evaluation is determined to be less than Virginia’s legal loads, the bridge is then posted in accordance with VDOT’s policies. All structures are to be analyzed and load rated in accordance with the National Bridge Inspection Standards, AASHTO Bridge Evaluation Manual, and the latest VDOT Structure and Bridge Division’s IIM-S&B-86-Load Rating and Posting of Structures (Bridges and Culverts), and memorandum dealing with load ratings.

2 Ordinary Maintenance Performance Requirements

The Project shall be subject to the Department’s Maintenance Rating Program (MRP), or subsequent update or replacement program. The Developer shall use the MRP to verify performance of each Asset against the criteria set out in the Performance Requirements Baseline Tables. The Developer shall include in the end of year report outlined in Section 1.10 of the Technical Requirements, a summary of the results of annual assessments in a format to be agreed between the Developer and the Department.

The Developer shall achieve and maintain an MRP rating of 90% or above for all Assets in accordance with the most current VDOT maintenance contract (“TAMS contract”) performance requirements in effect on other similar highways within Northern Virginia, unless otherwise noted in Table 4.5b below. The Developer shall achieve the criteria in VDOT maintenance contract (“TAMS contract”) or Table 4.5b and shall cause the level of maintenance attained to be uniform and consistent at all times. All Asset Groups shall achieve a minimum rating of 90% unless otherwise noted herein.

Table 4.5b – Ordinary Maintenance Performance Requirements Baseline Table				
Asset	Outcome	Minimum (%)	Ordinary Maintenance Criteria and Timeliness Requirements	UOM
ROADSIDE ASSET GROUP – In accordance with the most current VDOT maintenance contract (“TAMS contract”) requirements in place in Northern Virginia on other similar highways.				
DRAINAGE ASSET GROUP – In accordance with the most current VDOT maintenance contract (“TAMS contract”) requirements in place in Northern Virginia on other similar highways.				
TRAFFIC ASSET GROUP– In accordance with the most current VDOT maintenance contract (“TAMS contract”) requirements in place in Northern Virginia on other similar highways or as specified below.				
Cable Locating: Electric, Fiber, Communications	Maintain Cable Facilities	90	<u>Ordinary Maintenance Criteria</u> <ul style="list-style-type: none"> • No errors per cable markings. • <2 linear ft. tolerance from actual cable plant. • Must maintain any and all cable infrastructure as as-built drawings. 	

Table 4.5b – Ordinary Maintenance Performance Requirements Baseline Table				
Asset	Outcome	Minimum (%)	Ordinary Maintenance Criteria and Timeliness Requirements	UOM
			<ul style="list-style-type: none"> Excavators are not to begin until all underground utilities have been marked including those that might be maintained by Miss Utility. Developer will mark all VDOT cables, Developer responsible for Miss Utility for work done under the contract <p><u>Timeliness Requirement</u></p> <ul style="list-style-type: none"> All cable marking requests must be logged and accomplished within 72 hrs of request or as otherwise agreed. All emergency cable marking requests must be accomplished within 4 hrs, unless agreed otherwise, or emergency cable marking preclude access. Emergency situations are defined as “a sudden or unexpected occurrence involving a clear and immediate danger, demanding immediate action to prevent or mitigate loss of, or damage to life, health, property or essential public services.” Damaged facilities due to mis-marked cables must be repaired or replaced within 8 hrs, or as otherwise agreed. 	
Junction Boxes	Maintain Junction Boxes	90	<p><u>Ordinary Maintenance Criteria</u></p> <ul style="list-style-type: none"> All junction or pull boxes shall be free from damage or missing parts. Boxes, frames, and covers shall be watertight except for approved weep holes. Must maintain any and all junction boxes infrastructure as as-built drawings. Covers shall be fitted with gaskets and secured with approved securing screws. <p><u>Timeliness Requirement</u></p> <ul style="list-style-type: none"> All damaged cable junction boxes and or pull boxes must be repaired within 7 days of discovery or notification if hazardous conditions exist, or within 30 day otherwise. 	
ROADWAY & SHOULDER ASSET GROUP– In accordance with the most current VDOT maintenance contract (“TAMS contract”) requirements in place in Northern Virginia on other similar highways.				

Table 4.5b – Ordinary Maintenance Performance Requirements Baseline Table				
Asset	Outcome	Minimum (%)	Ordinary Maintenance Criteria and Timeliness Requirements	UOM
BRIDGE ASSET GROUP – In accordance with the most current VDOT maintenance contract (“TAMS contract”) requirements in place in Northern Virginia on other similar highways.				
SERVICES GROUP – In accordance with the most current VDOT maintenance contract (“TAMS contract”) requirements in place in Northern Virginia on other similar highways, or as specified below				
TRAFFIC MANAGEMENT SERVICE – In accordance with the most current VDOT maintenance contract (“TAMS contract”) requirements in place in Northern Virginia on other similar highways, or as specified below				
MISCELLANEOUS INFRASTRUCTURE AND REST AREA ASSET GROUP				
Building Maintenance and Repair	Buildings structurally sound and serviceable	90	<p><u>Ordinary Maintenance Criteria</u></p> <ul style="list-style-type: none"> • structural integrity of all buildings is maintained at all times • Electrical systems, HVAC systems, and communication lines, fully functioning • No material paint blistering or peeling, mildew, or mold, rusted metal fittings. <p><u>Timeliness Requirements</u></p> <ul style="list-style-type: none"> • General maintenance issues of a material nature to be addressed within 7 days of notification or discovery. • Issues affecting public safety to be addressed immediately 	Annual Report

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 4.6

Maintenance Responsibility Matrix

Attachment 4.6: Maintenance Responsibility Matrix

66 Express Lanes Project			
MAINTENANCE ITEM	INSPECTIONS (I)	ROUTINE (R)	MAJOR (M)
Pavement			
(1) Mainline for Express Lanes	Developer	Developer	Developer
(2) Mainline Striping for Express Lanes	Developer	Developer	Developer
(3) Ramps to and from the Express Lanes ^a	Developer	Developer	Developer
Bollards			
Bollards	Developer	Developer	Developer
Buffer Zone			
4' Buffer Zones ^b	Developer	Developer	Developer
Structures - Express			
(1) Signs	Developer	Developer	Developer
(2) Walls	Developer	Developer	Developer
(3) Bridges	Developer	Developer	Developer
Structures - Shared			
(1) Signs	VDOT ¹	Developer ²	Developer ²
(2) Walls	VDOT ¹	Developer ²	Developer ²
(3) Bridges	VDOT ¹	Developer ²	Developer ²
Duct Bank			
Duct Bank (Power & Communications), Junction Box	Not Applicable	Shared ³	Shared ³
Sign Panel - VDOT			
Signs	VDOT	VDOT	VDOT
Sign Panel - Express			
Signs	Developer	Developer	Developer

Attachment 4.6: Maintenance Responsibility Matrix

66 Express Lanes Project			
MAINTENANCE ITEM	INSPECTIONS (I)	ROUTINE (R)	MAJOR (M)
Drainage System - Express Lanes^c			
Drainage Inlets - within Express Lanes	Developer	Developer	Developer
Drainage Pipes/culverts - within Express Lanes & Median	Developer	Developer	Developer
Drainage Systems - VDOT^d			
Drainage Systems - VDOT	VDOT	VDOT	VDOT
Stormwater Management Ponds & BMP's			
Stormwater Management Ponds & BMP's (outside of Express Lanes)	VDOT	VDOT	VDOT
Stormwater Management Ponds & BMP's (inside Express Lanes)	Developer	Developer	Developer
ITS - Express Lanes			
ITS - Express Lanes	Developer	Developer	Developer
TTMS - Express			
(1) Equipment	Developer	Developer	Developer
(2) Toll Gantries	Developer	Developer	Developer
(3) ITS Poles	Developer	Developer	Developer
(4) ITS Poles - Shared	Developer ⁵	Developer ²	Developer ²
Median Mowing & Median Maintenance			
Median Mowing & Median Maintenance within Express Lanes	Developer	Developer	Developer

Attachment 4.6: Maintenance Responsibility Matrix

	66 Express Lanes Project		
MAINTENANCE ITEM	INSPECTIONS (I)	ROUTINE (R)	MAJOR (M)
Lighting			
Lighting - Median ^e	Developer	Developer	Developer
Lighting - Express Ramps	Developer	Developer	Developer
Lighting - Mainline GP Right Shoulder	VDOT	VDOT	VDOT
Utility Marking			
Utility Marking - Express's Assets	Developer	Developer	Developer
Utility Marking - VDOT's Assets	VDOT	VDOT	VDOT
Utility Marking - Shared Assets	Developer	Developer	Developer
Roadside Safety Treatment			
Roadside Safety Treatment - Express	Developer	Developer	Developer
Roadside Safety Treatment - Shared	Not Applicable	Shared ²	Shared ²
Roadside Safety Treatment - VDOT	VDOT	VDOT	VDOT
Sound Walls			
Sound Walls - Express Ramps	Developer	Developer	Developer
Sound Walls - GP	VDOT	VDOT	VDOT
Maintenance Facility			
Maintenance Facility	Developer	Developer	Developer
Emergency Crossover			
Emergency Crossover ^f	Not Applicable	Developer	Developer

Attachment 4.6: Maintenance Responsibility Matrix

OPERATIONS	66 Express Lanes Project		
Safety Service Patrol - Within Express Lanes	Developer	Developer	Developer
Safety Service Patrol - GP Lanes	VDOT	VDOT	VDOT
Ops Center	Developer	Developer	Developer
Incident Management - Within Express Lanes	Developer	Developer	Developer
Traffic Management - Within Express Lanes	Developer	Developer	Developer
Traffic Signals	VDOT	VDOT	VDOT
Back Office Support	Developer	Developer	Developer
Center-to-Center Connectivity	Not Applicable	Shared ⁴	Shared ⁴
Redundancy Ring	Developer	Developer	Developer
GP Lane Management - Operating Shoulder Lane	VDOT	VDOT	VDOT
Tolling System Requirements	Developer	Developer	Developer
Express Lanes HOV Enforcement by VSP	Developer	Developer	Developer
Enhanced Express Lanes Traffic Management by VSP	Developer	Developer	Developer
Park & Ride Lots (O&M)	VDOT	VDOT	VDOT
Ramps & Roads Connecting Park & Ride Lots from Express Lanes	Developer	Developer	Developer
E-Zpass Logo & Purple Pavement Marking	Developer	Developer	Developer
Route Shield Pavement Marking	Developer	Developer	Developer
Express OPS			
Customer Service	Developer	Developer	Developer
Snow and Ice Removal ⁶	Developer (Express Lanes)		VDOT (GP Lanes)

Attachment 4.6: Maintenance Responsibility Matrix

Notes:
<i>1 - VDOT will be responsible for inspection. Labor cost will be shared 50/50</i>
<i>2 - Developer will be responsible for maintenance. Labor cost will be shared 50/50</i>
<i>3 - Duct bank is shared 50/50. Developer will be responsible for maintenance of Developer assets such as power and communication cables. VDOT will be responsible for maintenance of VDOT assets such as power and communication cables</i>
<i>4 - Developer will be responsible for maintenance of fiber optic cables on Developer's side of the firewall. VDOT will be responsible for maintenance of fiber optic cables on VDOT's side of the firewall.</i>
<i>5 - Developer will be responsible for inspection. Labor cost will be shared 50/50</i> <i>a - Scope of responsibility for ramps shall include the acceleration/deceleration lane, including taper. If the ramp lane becomes an auxiliary lane, or the auxiliary lane becomes a ramp lane, then the scope of responsibility will terminate 1500 feet from the gore (between Express Lanes ramp and general purpose lane). For ramps connecting to arterial roads, maintenance limits shall terminate at the cross road. All roadside features (i.e. guardrail, barrier, light pole, conduit etc...) within ramp limits shall be the responsibility of the Developer. The Developer and the Department will finalize the specific maintenance limit parameters in the JOMP.</i> <i>b - Buffer zone includes bollards, striping (4 lines) , and pavement restoration</i> <i>c - All inlets, pipes, and culverts within the Express Lanes conveying drainage exclusively from the Express Lanes</i> <i>d - Cross pipes/culverts between Express Lanes and GP lanes conveying GP and Express Lanes drainage</i> <i>e - Includes light poles located in median and median barrier</i> <i>f - Maintenance limits to include bollards and everything within Express Lanes</i>
<i>6 -Developer shall be responsible for snow and ice removal of the Express Lanes. This shall include the buffer zone, the access ramps, and gore areas at the access ramps.</i>

Transform 66 P3 Project

Exhibit C

Technical Requirements

Attachment 4.7

Conceptual Tolling Zones and Points

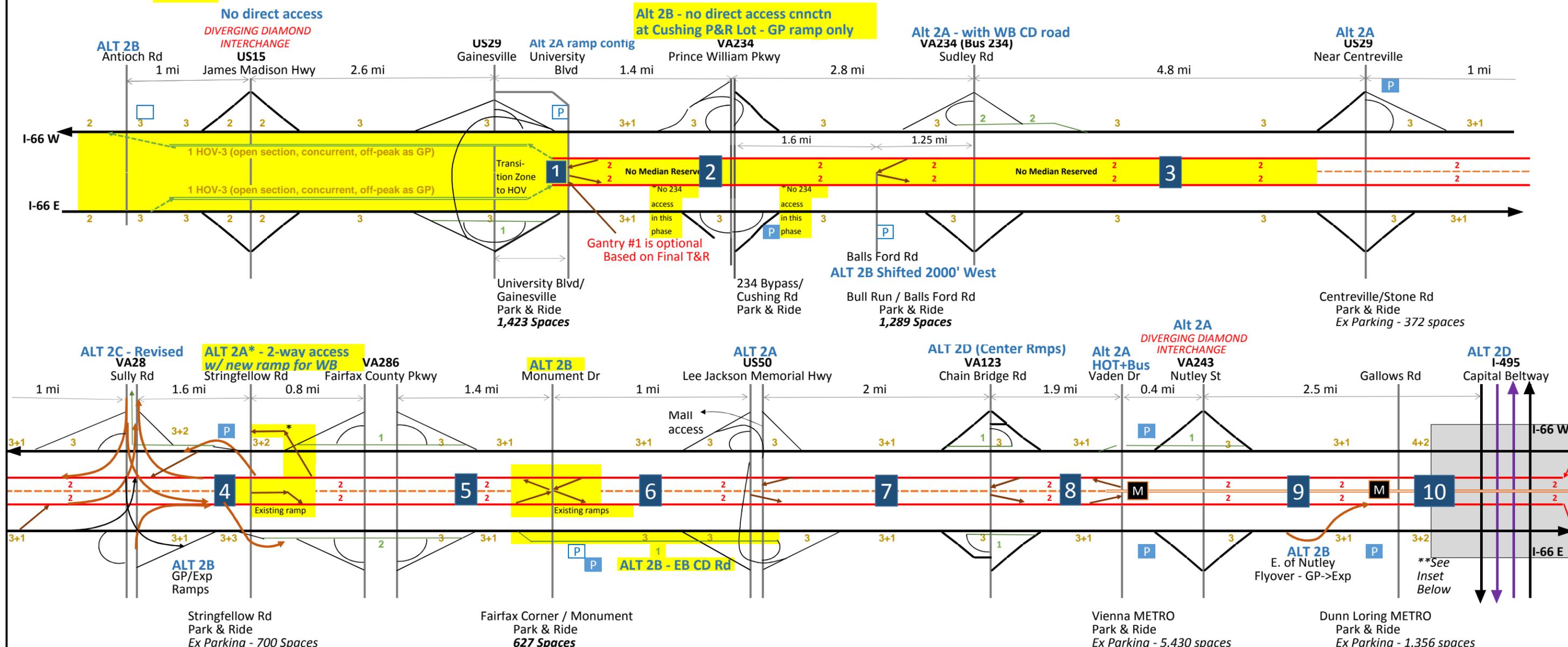
VDOT I-66 Managed Lanes Configuration

Build Scenario Access Points - Sept 21, 2015

Preferred Alternative - PHASE 1

66 Express Lanes Attachment 4.7 Conceptual Tolling Zones and Points - DRAFT

Execution Version
Technical Requirements



LEGEND

- General Purpose (GP) Lanes
- Cross Roads / Ramps
- Existing METRO Rail
- Existing HOT Lanes / Ramps
- Proposed HOT Lanes
- Proposed HOT Lane System Connection Ramps
- Proposed HOT Lane Arterial Connection Ramps
- Proposed Collector Distributor (CD) lanes
- Distance Between Arterials
- METRO Orange Line Stations
- General Purpose Lanes + Aux Lane
- Number of CD Lanes
- Number of HOT Lanes
- Existing Park/Ride Lot
- Proposed Park/Ride Lot
- Potential Toll Gantry Location
- Median reservation for potential future METRO rail extension

I-66 / I-495 Interchange Inset

I-66 / I-495 Interchange General Purpose (GP) & HOT Ramp Connections

	I-66 EB GP	I-66 EB HOT	I-66 WB GP	I-66 WB HOT	I-495 NB GP	I-495 NB HOT	I-495 SB GP	I-495 SB HOT
I-66 EB GP					E			
I-66 EB HOT								
I-66 WB GP								
I-66 WB HOT								
I-495 NB GP	E		E	P				
I-495 NB HOT	E		P	E				
I-495 SB GP								
I-495 SB HOT								

E = Existing connection
P = Proposed connection
= Alt 2A ramp eliminated

Diagram not to scale