

EXECUTION VERSION – JULY 31, 2012

I-95 HOV/HOT Lanes Project

Exhibit C

Technical Requirements

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Exhibit C

TECHNICAL INFORMATION & REQUIREMENTS

PURPOSE

The purpose of this Exhibit C 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 Concessionaire.

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
BMS	Building Management System
CADD	Computer Aided Drafting and Design
CCI	Critical Condition Index
CRM	Customer Relations Management
CTA	Cement Treated Aggregate
DBE	Disadvantaged Business Enterprise
DE	Design Exception
DW	Design Waiver
EPA	Environmental Protection Agency
FDC	Field Design Change
F.O.B.	Free on Board
GCS	Gate Control System
GP	General Purpose
HOT-OC	HOT Operations Center
HPC	High Performance Concrete
HPS	High Performance Steel
ICD	Interface Control Document
ID	Asset Identification
IDMS	Incident Detection and Monitoring System
IPPM	Internal Policy/Procedure Memorandum
IRI	International Roughness Index
JOMP	Joint Operating and Maintenance Protocols
LCAMS	Lane Closure Advisory Management System
LDR	Load-related Distress Rating
LL	Live Load
LPN	License Plate Number
LRFD	Load and Resistance Factor Design

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Acronym	Definition
MATOC	Metropolitan Area Transportation Operations Coordination
MLHCC	Modified Latex Hydraulic Cement Concrete
MOMS	Maintenance Online Management System
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
NBIS	National Bridge Inspection Standards
NCR	Non-Conformance Report
NDC	Notice of Design Change
NDR	Non Load-related Distress Rating
NRO	Northern Regional Operations
NTCIP	National Transportation Communications for ITS Protocol
O&M	Operations and Maintenance
OCR	Optical Character Recognition
ORT	Open Road Tolling
OSPS	Operating Speed Performance Standard
PDM	Precedence Diagram Method
PE	Professional Engineer
PIP	Public Information Plan
PS&E	Plans, Specifications, and Estimate
PVC	Polyvinyl Chloride
RWIS	Road Weather Information System
SPI	Schedule Performance Index
SWaM	Small, Women- and Minority-owned Business Enterprise
T&DI	Toll and Driver Information
TAC	Transit Advisory Committee
TAMS	Turnkey Asset Maintenance Services
TCP	Traffic Control Plan
TCRO	Traffic Control Room Officers
TOC	Traffic Operations Center
TS&L	Type, Size, and Location
UIT	Ultrasonic Impact Testing
VDEM	Virginia Department of Emergency Management
VECTOR	Virginia Evacuation Coordination Team for Operational Response
VES	Vehicle Enforcement System
VOD	Vehicle Occupancy Detection
VOS	Volume, Occupancy & Speed
VSLs	Variable Speed Limit Signs
WBS	Work Breakdown Structure
WMATA	Washington Metropolitan Area Transit Authority

DEFINITIONS

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

Best Efforts means exerting every available resource and allowing sufficient time (a minimum of 30 days) to settle claims with landowners amicably.

Bridge Class Culvert is as defined in Section 3.15.2.A.1.i. of the Technical Requirements.

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

Design Exception 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 Waiver is defined as a document required where it is impractical nor not economical to obtain the AASHTO minimum design criteria as shown in the Geometric Design Tables. In such a case, an exception shall be secured from the State Location and Design Engineer and FHWA (if applicable).

Disaster Recovery Plan is as defined in Section 3.16.24 of the Technical Requirements.

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

Federal Degradation Standard is as defined in Section 4.4.5 of the Technical Requirements.

Free Flow means conditions where vehicular traffic can maintain generally consistent speeds without experiencing undue delay or breakdown in flow.

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 Concessionaire control.

International Roughness Index (IRI) is the standard measure of ride quality used by the Department.

Load-related Distress Rating (LDR) is a deduct-based index having a value of 100 when the pavement being evaluated has no discernible load-related distress.

Major Rehabilitation is as defined in Section 3.15.5.3 of the Technical Requirements.

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 1.4.1.C of the Technical Requirements.

Non Load-related Distress Rating (NDR) is a deduct-based index similar to the Load Rated Distress Rating (LDR) except that the distresses assigned to the index are non-load rated.

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. – 9:00 a.m. or 4:00 p.m. – 7:00 p.m., Monday through Friday, excluding holidays.

Percent Degradation is defined in Section 4.4.4.C 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 Recovery Schedule is schedule submitted by the Concessionaire to the Department whenever the Monthly Progress Report shows the Guaranteed Substantial Completion Date has 90 days of negative float; 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.

Project Roll Plan is a scaled signage plan or plans showing proposed, existing, or relocated DMS and static signs on the I-95 Corridor 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 northbound and southbound directions, one segment commencing at the first/last Mainline sensor station prior to the exit at the southern terminus and ending at the lane drop/lane gain at the Prince William Parkway ramp and the second segment commencing at the lane drop/lane gain at the Prince William Parkway ramp and ending at the first/last Mainline sensor station prior to the exit at the northern terminus.

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.

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

Security Plan is as defined in Section 3.16.23 of the Technical Requirements.

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

Standard of Care means using logical, rational, and commonsensible calculation and precaution in determining whether there is reason to believe that property to be acquired for rights of way may contain concealed or hidden wastes or other materials or hazards requiring remedial action or treatment.

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

Substructure means the part of a structure that is below the bearings of simple and continuous spans, skewbacks of arches, and tops of footings of rigid frames, together with the back walls, wingwalls, and wing protection railings.

Superstructure means the portion of a structure that is not defined as substructure.

Timeliness Requirements are as defined in Attachment 4.5 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 HOT Lanes.

Transponder Transaction Performance means the percentage of vehicles with transponders that are correctly identified by the Tolling System.

1 Project Management

1.1 Overview

- A. The Concessionaire 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 (PDPs), as described in the Agreement.
- B. 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 Concessionaire.

1.2 Project Administration

1.2.1 General Requirements

- A. The Concessionaire'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 tools, facilities, and materials; environmental protection and mitigation; safety of Work personnel; and any other management elements needed to produce and document a quality, safe, efficient, and operable Project that complies with Good Industry Practice.
- B. All prospective Contractors and prime contractors of joint ventures shall prequalify with the Department and shall have received a certification of qualification.
- C. The Concessionaire shall not subcontract any part of the Work to a Contractor who is not prequalified with the Department. This restriction does not apply to consultants, manufacturers, suppliers, or haulers. Consent to subcontract or otherwise delegate any portion of the Work shall not relieve the Concessionaire of any responsibility for the fulfillment of the entire Agreement. Further, delegation or subcontracting of the Concessionaire's responsibilities shall not diminish the Concessionaire's obligation to report directly to the Department, unless the Department expressly agrees to accept reports or communications from third parties.
- D. The Concessionaire shall note and comply, where applicable, with the requirements of the eVA vendor system prior to the execution of the Agreement.

1.2.2 Department Staffing and Points of Contact

- A. The Department will provide a project-specific management structure with a combination of dedicated and shared resources to manage and oversee the Department’s rights or interest in the Project.
- B. Authority of the Department Representative:
 - 1. Inspection by the Department Representative shall not relieve the Concessionaire of any obligation to furnish acceptable materials or provide completed construction that is in accordance with the Agreement.
 - 2. The Department Representative is authorized to conduct independent inspection and oversight of all Work performed and materials furnished, in accordance with the Agreement. As noted the Agreement, the Department has the right at all times during the Term to carry out Oversight Services with respect to all aspects of the development, construction, and operations of the Project.

1.2.3 Workers

- A. Each party shall notify the other party, in writing, if they believe any person employed by the Department or the Concessionaire, or any Contractor:
 - 1. Is not performing his or her work in a proper or skillful manner;
 - 2. Is intemperate or disorderly; or
 - 3. Is acting in an unsafe manner.
- B. The party receiving the notice will immediately investigate the specifics of the notification and provide a response to the party initiating the notification, within 5 days, detailing a plan of action to resolve the written concerns. If the employees’ actions create an unsafe environment for the Concessionaire’s workers, the Department personnel or travelling public, the notified party will immediately stop the operations to resolve safety issues in accordance with the Agreement.

1.2.4 Quality Management System

- A. The Concessionaire shall cause to be developed, implemented and maintained a quality management system that includes a Quality Management System Plan (QMSP) that will meet the standards and

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specifications set forth in Attachment 1.5a, including the Department's *Minimum Requirements for Quality Assurance & Quality Control on Design-Build & Public-Private Transportation Act Projects – July 2008*. Where appropriate, the QMSP also will incorporate requirements from the Department's *Manual of Instruction-Materials Division, Design Manuals, Construction Manual, CD Memorandums, Maintenance Manual, and Inspection as well as Road and Bridge Specifications, Road & Bridge Standards, MUTCD, Virginia Work Area Protection Manual*.

- B. The QMSP shall be consistent with the relevant requirements of the current version of ISO 9001.
- C. 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.
- D. The Concessionaire's QMSP will describe the roles of the Design Build Contractor and the O&M Contractor in the implementation of the pertinent sections of the Concessionaire's quality management system for the Work.
- E. The Concessionaire's Contractors, sub consultants, 2nd tier or 3rd tier sub consultants shall adhere to the QMSP.
- F. The Concessionaire will regularly review and report to the Department its compliance with all PDPs as part of their quality systems.
- G. The Concessionaire and its Contractors will 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 Concessionaire's obligations under the Agreement are met.
- H. The Concessionaire or its designees shall be responsible for all quality assurance and quality control activities required to manage its own processes as well as those of its contractors, subcontractors, and suppliers of any tier.
- I. The Concessionaire may use the Department's resources for the following construction quality control activities where the Department routinely provides these services:
 - 1. offsite programmatic inspection, including supplier plant acceptance inspections and
 - 2. offsite programmatic testing, including supplier plant acceptance testing.

1.2.5 Submittals

- A. The Concessionaire shall or shall cause to be coordinated, delivered, and processed, all submittals to the Department as required by the Agreement.
- B. The Concessionaire shall cause all draft, revised, and final submittals to be accurate, complete, and in a form and at a level of detail to enable the Department to satisfactorily discharge its review and approval obligations.
- C. Subject to applicable confidentiality requirements or as required by Law, the Concessionaire shall issue to the Department or make available through an Electronic Document Management System (EDMS) or other type of approved electronic storage and retrieval system, hard copies and electronic copies of all correspondence, meeting minutes, and other external documents (including emails) constituting any and all material project communications with:
 - 1. Governmental Authorities;
 - 2. Business and Project stakeholders;
 - 3. Landowners
 - 4. News media;
 - 5. Utilities;
 - 6. Railroads; and
 - 7. Community stakeholders.
- D. The Concessionaire shall provide all Design Documentation and Construction Documentation as both hard-copy and electronic files. These documents will be deemed “received” by the Department (thereby triggering the applicable timeframe for review) on submission of both electronic and hard copy files, inclusive of all required information necessary to perform a complete review. Packages received after 3:00pm will be deemed received the following business day. The Department will notify the Concessionaire within seven days if the package is incomplete. These documents will include (but are not limited to) the following items:
 - 1. Design calculations and analysis;
 - 2. Mix designs;

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3. Reports, studies, and investigations;
 4. Project Schedule;
 5. Design Public Hearing Documentation;
 6. Design Documentation for field inspection and right-of-way
 7. Detailed design submittal and Approved for Construction (AFC) documents, construction sketches, shop drawings, and diagrams;
 8. Soil boring logs, laboratory test results, quality control records and audits, etc.;
 9. Material communications relating to Design Documentation and Construction Documentation;
 10. Responses to reviewed comments from the Department;
 11. Change Orders (including all related communications and disputes resolution proceedings);
 12. Governmental Approvals, and;
 13. Third party approvals.
- E. Design submittals will be submitted in *.pdf format and hard copy. AFC Documents will include the CADD files in *.dgn format, *.pdf format and hard copy.
- F. The Department may request the CADD *.dgn files at interim design submittals to facilitate review.
- G. The Concessionaire will be required to provide five hard copies of all submittal documents for the Department's reviews.
- H. The Concessionaire shall transfer all electronic document submittals into the project EDMS or through a secure website maintained by the Concessionaire. All files shall be well organized and easy to locate in accordance with the Agreement. The file transfer shall be conducted as follows:
1. E-mail may be used to notify the Department of the availability of the document files, and if a file transfer protocol or SharePoint website or other type of approved electronic data storage and retrieval system is used, the e-mail must include a link to the document file to facilitate access and download.

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- I. Whenever the Concessionaire is obligated to make a submittal pursuant to the Agreement, the Concessionaire shall include with such submittal the signed cover sheets described below.
 1. A cover sheet, signed by the Concessionaire's Representative, that includes the following certification:
 - i. The Concessionaire certifies or has caused to be certified that [description of submittal] was prepared by professionals having the requisite qualifications, certifications, credentials, skills, and experiences needed to prepare the submittal in accordance with Good Industry Practice and the requirements of the Agreement
 - ii. The Concessionaire certifies or has caused to be certified 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:
 - a. the Agreement (including Good Industry Practice);
 - b. the Technical Requirements;
 - c. the approved QMSP;
 - d. applicable Law; and
 - e. Governmental Approvals.
 2. A cover sheet, signed by the Contractor who prepared or is otherwise in responsible charge of the submittal, that includes the following certification:
 - i. The [name of Contractor], which is under contract with the Concessionaire or one of its Contractors to perform services related to the Agreement, certifies that it prepared or is otherwise in responsible charge of the [description of submittal].
 - ii. The [description of submittal] was prepared by professionals having the requisite qualifications, certifications, credentials, skills, and experiences needed to prepare the submittal in accordance with

Good Industry Practice and the requirements of the Agreement.

- iii. The [description of submittal] is complete and accurately depicts the Work to be undertaken or performed; and the submittal was prepared in accordance with, and otherwise complies with:
 - a. the Agreement (including Good Industry Practice);
 - b. the Technical Requirements;
 - c. the approved QMSP;
 - d. Law; and
 - e. Governmental Approvals.

- J. The Concessionaire 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 Concessionaire shall submit to the Department for its review and approval a schedule for the submission of Design Documentation and Construction Documentation by the Concessionaire to the Department. 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 and /or Construction Documentation to the Department by the Concessionaire.

- L. Following the commencement of design Work, the Concessionaire 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 and the Concessionaire shall reasonably comply with such update requests.

- M. Unless otherwise mutually agreed by all parties, weekly submittal status meetings will be held to review all anticipated submittals, current submittals and pending re-submittals.

- N. If at any given time the Concessionaire makes multiple submittals, the Concessionaire shall indicate to the Department the priority assigned to each submittal to foster a timely and coordinated review by the Department.

- O. Documents that will be reviewed and/or approved by the Department include the AFC Construction Documentation covering individual work packages, including interface points used by the Concessionaire during its design review process, the Design Public Hearing Documentation, Design Documentation for field inspection and right-of-way, and all changes to the AFC Plans including Notice of Design Changes (NDCs), Field Design Changes (FDCs), and Non-Conformance Reports (NCRs).
- P. AFC Documents shall include all drawings, specifications, revisions thereto, and any other items necessary to construct the Work, which shall be sealed by a Professional Engineer. Prior to submission of AFC Documents to the Department for review and approval, the Concessionaire shall complete or shall cause to be completed a review of the AFC Documents.
- Q. The Department may request interim submittals at any time for any of the above noted items for complex or unusual elements of the Work, or for elements where no applicable standards exist, if the Department can reasonably demonstrate that additional information is necessary to complete review of any such Work. 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, or other such timeframe as may be mutually agreed upon.
- R. Required submittals, excluding the interim submittals outlined in the Agreement, to be signed and sealed by professional licensure licensed by the State.

1.2.6 Plans and Working Drawings

- A. Concessionaire 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 Concessionaire 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 Concessionaire shall identify working drawings and submittals by the complete State

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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 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; retaining walls and foundations.
- E. The Concessionaire shall provide five hard copies (together with one electronic version in a format acceptable to the Department) 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 Concessionaire within 21 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 Concessionaire 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 Concessionaire 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 Concessionaire by a Professional Engineer licensed in the State. 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 Concessionaire'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 Concessionaire of responsibility for errors and/or omissions in the working drawings.
- H. Notice of Design Changes (NDC) and Field Design Changes (FDC) that are required after issuance of the Department's approval of the Approved for Construction (AFC) drawings must be resubmitted to the Department for review prior to implementation of 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 Concessionaire in writing by the Department.

- I. The plans and working drawings shall be appropriately signed and sealed by professional licensure, as applicable.

1.2.7 Location of Offices and Accommodations for Department’s Staff during the Construction Period

- A. The Concessionaire shall establish one field office, the location of which is to be determined and mutually agreed to by the Concessionaire and the Department. This work shall consist of locating, procuring, furnishing, erecting, equipping, maintaining, cleaning (weekdays) and removing & restoring property upon completion of use of the field office. This office shall be for the exclusive use of Department’s engineers and inspectors. The Concessionaire has the choice to either provide modular trailers or rent office accommodations to satisfy the Project office requirements.
- B. The field office shall include the following:
 1. Minimum of 150 square feet per person, for a maximum of 10 personnel;
 2. Minimum of 2 – 12’ x 12’ hard offices;
 3. Minimum of 4 – 8’ x 8’ cubicles or work areas with work surface, cabinets and drawers, and other standard items in office cubicles;
 4. Standard office furniture (desk 60”x 34”, chairs with rolling casters, rolling pad, stapler, tape dispenser);
 5. 1 – 4 drawer metal fire protection file cabinet per person;
 6. 1 – 4 shelf bookcase per person;
 7. 1 dry erase board with eraser and markers;
 8. 1 computer or laptop connection per person/workstation (IT to provide minimum specifications);
 9. All computer connections and copying equipment shall have networking and internet capabilities;
 10. Provide infrastructure and access capabilities to the internet;
 11. 1 black/white printer (IT to provide minimum specifications);

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12. 1 color printer per (IT to provide minimum specifications);
13. 1 microwave oven min 1000 watts;
14. 1 full size refrigerator;
15. 1 wastebasket per person;
16. First Aid kit containing eyes and skin protection for emergencies.
17. 1 copy machine per with minimum features: capable of coping 8 ½” by 11” up to 11”x 17”, sorter, automatic feed and paper selection, magnification and reduction, service contract for maintenance and drum toner replacement;
18. 1 scanner/plotter/fax machine;
19. Smoke detectors and fire extinguishers in accordance with local codes;
20. Installation and payment of phone service available for each cubicle with answering and message services;
21. Installation and payment of internet service available for each computer;
22. Installation and payment of utilities to operate all field office functions;
23. Minimum 15 parking spaces readily adjacent to the office structure;
24. Minimum 12’ x 20’ conference room with conference table and conference chairs to seat 15 people. Conference room to be supplied with a phone suitable for conducting conference calls; plus 1 dry erase board wall mounted, minimum 25 square feet, with eraser and markers
25. Plan Rack for 24” x 36” drawings with 12 plan clamps;
26. 1 Plan and Drafting Tables (30” x 96”) with adjustable stools;
27. 10’ x 10’ Receptionist area with counter style work area;
28. Water Coolers or continual supply of bottled water adequate for 40 people;

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29. Office structure shall be watertight and have a robust HVAC system to maintain a temperature of 72 degrees Fahrenheit in all areas of the office throughout all seasonal effects;
 30. Adequate lavatory facilities to account for 20 personnel both men and women;
 31. All utility (electric, gas, water, sewer, telecommunications, phone) feeds, connections, disconnections and bill payments shall be borne by concessionaire;
 32. 8' x 10' kitchen area with a sink and one lunch-style table and chairs to seat a total of 6 people;
 33. 10'x10' storage room with a door having a locking assembly. 10 spare keys shall be provided to the Department;
 34. Adequate number of windows to allow for natural light entrance per architectural standards. Windows shall have screens and the capability to open to allow the entrance of outside air. Windows shall also have locking assemblies;
 35. Adequate overhead lighting in all parts of the office per architectural standards;
 36. Exterior doors shall be equipped with adequate locking assemblies. 20 spare keys shall be provided to the Department;
 37. 1 Paper shredder;
 38. Weekday janitorial services; and
 39. Exterior way finding and project office identification signage;
- C. The field office shall be available and operational from 60 days after the latter of Financial Close or Design Work Notice to Proceed to 120 days after Final Acceptance. Furnishings and equipment specified shall be in sound and functional condition throughout the duration of the project.
- D. The field office and equipment as required herein shall remain the property of the Concessionaire
- E. The field office shall be separated from buildings and trailers used by the Concessionaire. The Concessionaire's construction staff shall be housed in field offices located on or adjacent to the Project.

- F. The Concessionaire 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.
- G. 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.
- H. **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. At least one of the light fixtures shall be a fluorescent light situated over the plan and drafting table. There shall also 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 Concessionaire.

1.2.8 Documentation Management System

- A. The Concessionaire shall establish and maintain an Electronic Document Management System (EDMS) to store and record all material documents generated on the Project, including those records required under Law.
- B. In the provision of an EDMS, the Concessionaire 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, 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.

- C. In the relevant PDP, the Concessionaire shall describe:
1. the specific EDMS tool to be used by the Concessionaire 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 Concessionaire shall be uniquely coded and retrievable in a user-friendly format;
 3. the routing, filing, control, search capabilities, and retrieval methods for all documents;
 4. methods to facilitate data sharing, including written procedures for accessing and searching of 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.

1.2.9 Project Meetings

- A. Authorized Representatives and other pertinent representatives of the parties shall meet within 10 days after the earlier of (i) Limited Notice to Proceed, issued in accordance with the Agreement or (ii) the Financial Closing Date to discuss issues affecting the administration of the Work and to implement the necessary procedures, including those relating to submittals and approvals, to facilitate the ability of the parties to perform their obligations under this Agreement.
- B. Within 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 and prior to Limited Notice to Proceed, the parties and their respective representatives shall conduct a pre-construction meeting to discuss the Concessionaire'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 Authorities and Utilities, and maintenance of traffic.
- C. The Concessionaire shall hold monthly progress meetings with the Department. During such meetings, progress during the prior month,

Work to be undertaken during the next month, and encountered or anticipated issues shall be reviewed, and the Concessionaire shall collect 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 Concessionaire 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. The Concessionaire 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 three days after the monthly progress meeting or such other timeframe as mutually agreed. The parties may cancel a monthly progress meeting from time to time if they mutually agree that such meeting is not necessary.

- D. As part of, and in conjunction with, the monthly meetings required by the Agreement, the Concessionaire shall provide the Department with any proposed update of the Baseline Schedule for the Department's review, and, if required by the Technical Requirements, approval, and a 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, work calendars, constraints, delays experienced and any pending Time Impact Analysis ("TIA"), float consumption if any, and the reasons for such consumption, documentation of any logic changes, duration changes, resource changes or other relevant changes. The monthly progress narrative shall also include the following:
1. comparisons of actual and planned progress, including: (1) illustrating schedule variance graphically by plotting the budgeted cost of work performed (BCWP) and the budgeted cost of work scheduled (BCWS); and (2) reporting the schedule performance index (SPI), defined as the ratio of BCWP divided by BCWS;
 2. a statement by the Concessionaire that the Baseline Schedule is the schedule being executed to perform the Work;
 3. details of any aspects of the Work which may jeopardize the completion in accordance with the Agreement; and
 4. measures being (or to be) adopted to overcome such aspects and a list of approvals needed to adopt such measures.
- E. Concessionaire and the Department shall agree to other meetings as appropriate and mutually agreed.

1.2.10 Source of Supply and Quality Requirements

- A. The QMSP shall describe procedures for ensuring that materials used throughout the Work conform to the requirements of the Agreement. Unless otherwise specified in the Technical Requirements or subject to mutual agreement, materials, equipment, and components that are to be incorporated into the finished Work shall be new. The Concessionaire shall file a statement of the known origin, composition, and manufacture of all materials to be used in the Work, including optional or alternate items as part of AFC Documents. The Concessionaire's statement shall be electronically submitted to the Department by use of the Department's Form C-25 after satisfying Concessionaire's Quality Management System Plan.

- B. All materials or equipment (excluding the equipment maintained and operated by the Concessionaire) physically installed, which will become part of the completed project, whether it is permanent or temporary, must conform to the requirements of the Agreement, and shall be furnished with valid test data required to document the quality of the material or equipment at least two weeks prior to delivery. The Concessionaire shall change the source of supply and furnish material or equipment from other approved sources if the requirements are not met and shall notify the Department of this change, and provide the same identifying information noted in this section, at least two weeks prior to delivery. Materials shall not contain Hazardous Waste or be furnished from a source containing toxic, hazardous or regulated solid wastes.

1.2.11 Invoicing from the Department to the Concessionaire

- A. The invoices will be a mutually agreed-upon format, and include a reasonable level of back-up documentation. Such invoices shall include the following:
 - 1. the Project number;
 - 2. a letter from the Department's project manager verifying the total amount of costs set forth in the invoice, the timeframe such costs were incurred;
 - 3. back-up documentation for vouchers for more than \$500.00 (the voucher back-up documentation will include the paperwork retained by the Department for audit purposes);
 - 4. back-up documentation including the production of the Department's timesheets, as housed in the Department's financial system.

1.3 Project Development Plans

1.3.1 General

- A. The Concessionaire shall provide Project Development Plans (“PDPs”) as defined in this section, and detailed in Attachment 1.3 to this Exhibit I. Such PDPs shall address the activities of the Concessionaire and shall not obligate the Department to perform any activity unless agreed to in writing by the Department.
- B. The PDPs shall meet the requirements of the Agreement. Further information regarding the development of the PDPs is noted in Attachment 1.3.

1.3.2 Project Development Plans

- A. The Concessionaire shall produce and maintain up-to-date 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 Concessionaire’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 Concessionaire 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

- A. The PDPs will be developed in accordance with Attachment 1.3.
- B. The Department’s rights of rejection of a PDP are limited to material issues that would provide a lower standard than the Concessionaire’s initial Project Development Plans presented in Attachment 1.3.

1.4 Schedules

1.4.1 Project Schedules

- A. Purpose, Format, and Content of the Project Schedule:
 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 utilized as a tool for measuring progress.
 3. The Project Schedule shall consist of the Initial Baseline Schedule, the Baseline Schedule, the monthly updates to the Project Schedule, and the As-Built Schedule.
 4. The Initial Baseline Schedule is the Concessionaire’s conceptual plan for the design and construction of the Construction Project and is attached to the Agreement. This schedule shall be used to monitor performance of the Work until the Baseline Schedule is approved by the Department pursuant to the Agreement.
 5. The Department shall review submittals of the Project Schedule in accordance with the VDOT Post-Award Scheduling Guide and the AACE Recommended Practice No. 53-06 as appropriate. Acceptance by the Department of the any Project Schedule will not relieve the Concessionaire 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 Concessionaire's Project Schedule. Furthermore, acceptance of the Project Schedule will not relieve the Concessionaire from complying with all the requirements of the Agreement, including, without limitation, requirements, sequences, constraints, and/or obligations.

- B. General Requirements: In the Project Schedule, the Concessionaire 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 Substantial Completion into activities with appropriate logic ties to show the Concessionaire's overall approach to sequencing, include logical relationships between activities reflecting the Concessionaire'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 and the Guaranteed Substantial Completion Date;
 7. show phasing of the Work as detailed in the 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. shall allocate an estimated cost/planned value to the appropriate lowest level elements (activities) of the Work Breakdown Structure (WBS);
 9. reflect the required coordination with other Contractors, Utility Owners, Governmental Authorities, engineers, architects, Contractors, and suppliers;
 10. identify regulatory Approvals required and the dates by which such approvals are necessary;
 11. shall be fully compliant with the Agreement;
 12. conform to the Work Restrictions (Section 1.8) and Maintenance of Traffic (Section 1.9) requirements; and
 13. reflect the ROW Acquisition and Relocation Plan.
- C. Monthly Progress Earning Schedule based on cost data generated from the Project Schedule. The progress earnings schedule shall depict planned progress based on anticipated earnings and shall depict monthly comparisons of actual versus planned progress, including: (1) illustrating the schedule variance graphically by plotting the budgeted cost of work performed (BCWP) and the budgeted cost of work scheduled (BCWS); and (2) reporting the schedule performance index (SPI), defined as the ratio of BCWP divided by BCWS for the Project to date and the monthly projections through Substantial Completion. For each occurrence of Major Maintenance or construction of a Concessionaire Project Enhancement during the Operating Period, the Concessionaire 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 Concessionaire shall be compatible with the Department's scheduling software. The Concessionaire'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 the latest version of Primavera's 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 Concessionaire. 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 Guaranteed Substantial 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 Concessionaire. No time extensions will be granted unless a Delay Event occurs which impacts the Project's critical path, consumes all available float or contingency time, and extends the work beyond the Guaranteed Substantial Completion Date as defined by the Agreement.

- F. If the parties cannot agree to a Schedule, either party may refer the disagreement to the dispute resolution procedures set forth in the Agreement.
- G. The Concessionaire shall maintain at all times, at its office, a minimum of one hard-copy complete set of all schedule reports shown above for the previous six months only. All schedule 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).

1.4.2 The Baseline Schedule

- A. Within 60 days of the Financial Closing Date, the Concessionaire shall submit to the Department for its review and approval a proposed Baseline Schedule, which shall include the Concessionaire's detailed plan for design and construction of the Project. The Concessionaire shall develop its proposed Baseline Schedule from the Initial Baseline Schedule. The Concessionaire shall submit to the Department six hard copies (printed on 11" by 17" 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 21 days of the Department's receipt of the proposed Baseline Schedule, the Department shall notify the Concessionaire in writing of its approval or disapproval of the proposed Baseline Schedule, and of any comments it has or amendments it wishes the Concessionaire to make. The Concessionaire 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 days of the Department's receipt of the re-submitted proposed Baseline Schedule, the Department shall notify the Concessionaire 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 a well 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 Closing Date until Substantial Completion.
- E. The Baseline Schedule shall include separate activities for major submittals proposed by the Concessionaire, together with appropriate activities for the Department's review or approval, provided that such review and/or approval times by the Department shall 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 30 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.

1.4.3 Monthly Progress Reports and Project Schedule Updates

- A. The Project Schedule will be current, reflecting actual progress at the time of submittal to the Department and will be kept current and submitted as a component of the Monthly Progress Report (further described below).
- B. During the Construction Period, the Concessionaire's Monthly Progress Report shall include the following:
 - 1. document control certification sheet (verification that all field documentation is being maintained);

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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. a 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 TIAs, and float. With each submission of the Project Schedule, the Concessionaire also shall include:
 - i. 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.
 - ii. A narrative progress report of the Project Schedule that describes, at a minimum, the Concessionaire's plan of operation for meeting the interim milestones and the Guaranteed Substantial 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 Time Impact Analyses, float consumption, documentation of any logic changes, duration changes, resource changes or other relevant changes.
 - iii. Time-scaled logic diagram indicating the critical path, early start and early finish dates, total float, sorted and grouped by the WBS.
 - iv. 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 (1) illustrating schedule variance graphically by plotting and budgeted cost of work performed (BCWP) and the budgeted cost of work scheduled (BCWS), and (2) reporting the scheduled performance index (SPI), defined as the ratio of BCWP divided by BCWS;
 6. identification of activities requiring Department/FHWA input or assistance, to the extent reasonably known;
 7. action items/outstanding issues;
 8. a work breakdown structure level 1 or level 2 design and construction schedule;
 9. Project cost summary;
 10. quality management reporting, as defined within the Concessionaire's QMSP, including quality inspection reports and daily inspection reports;
 11. a statement by the Concessionaire that the Baseline Schedule is the schedule being executed to perform the Work;
 12. nonconformance reports and resolution reports;
 13. right of way acquisition activities;
 14. environmental compliance activities;
 15. DBE/SWAM quarterly usage;
 16. safety activities;
 17. digital photographs of the progress of the Project; and
 18. 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. The Monthly Progress Report shall describe the work performed since the previous update as well as the Concessionaire's plan for accomplishing the remaining Work. It shall describe the current status of the Project and any deviations from scheduled performance as well as the causes and effects of the deviations. It shall also describe any progress deficiencies or schedule slippages as well as any actions taken or proposed to avoid or mitigate the progress deficiencies or schedule slippages.

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- D. 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.
- E. The Department will notify the Concessionaire of any comments within five days of receipt of an acceptable submission a Monthly Progress Report.
- F. Project Schedule Updates:
 - 1. Concessionaire 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 on-going, or completed as of the new data date; show actual start dates for activities that have started; and actual finish dates for completed activities.
 - 4. Project Schedule Updates shall depict percent complete for on-going 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 on-going 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 on-going activities or to reflect the Concessionaire’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 Concessionaire as the As-Built Schedule.

1.4.4 During the Construction Period, the Concessionaire 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 weeks.

1.4.5 Revisions To Baseline Schedule

- A. If the Department believes in its reasonable discretion that the Baseline Schedule needs a specific revision either in logic, activity duration, WBS, manpower, or cost, the Department will request the Concessionaire in writing to make such revisions. The Concessionaire shall give due consideration to the Department's suggested revision and, upon consultation with the Department, if determined appropriate, make such revisions within ten 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 Concessionaire 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 Concessionaire 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 Concessionaire objects to the Department's request for revisions, the Concessionaire 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 Guaranteed Substantial Completion Date to the Concessionaire 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 Guaranteed Substantial Completion Date has 90 days of negative float, the Concessionaire 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 Concessionaire shall archive all approved Project Schedules.

1.4.7 Time Impact Analysis (TIA) for Proposed Extensions of Time

The following shall apply if a Time Impact Analysis (TIA) is required by the Agreement:

- A. The TIA shall be based on the date on which the alleged Delay Event is claimed to have occurred, or, in the event of a proposed change, the date on which the implementation of such change is proposed to be commenced.
- B. 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.
- C. Each TIA shall include a Fragmentary Network (“fragnet”) demonstrating how the Concessionaire proposes to incorporate the impact into the Baseline Schedule. A fragnet is defined as the sequence of new activities and/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 fragnet shall identify the predecessors to the new activities and demonstrate the impacts to successor activities. The Concessionaire shall insert the fragnet into the Baseline Schedule, run the schedule calculations, and submit the impacted schedule in accordance with this section. The Concessionaire shall include a narrative report describing the effects of new activities and relationships to Agreement milestones and the Guaranteed Substantial Completion Date with each TIA.
- D. Except as provided in the Agreement, the Concessionaire shall not be entitled to any extension of the Term automatically as the result of an activity delay. The Concessionaire 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 Guaranteed Substantial Completion Date.

- E. 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.
- F. Upon approval, a copy of the TIA signed by the Department will be returned to the Concessionaire 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”.
- G. 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 Concessionaire 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.

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 1.5a, considering life cycle, operations and maintenance requirements. Where the Concessionaire’s design requires design methods or construction procedures not covered by the attached list of Standards and Specifications, the Concessionaire shall obtain the Department’s approval before using such methods or procedures, not to be unreasonably withheld or delayed. The Concessionaire's obligations to conform the Work to the requirements set forth in manuals described in the Agreement and Attachment 1.5a will be satisfied if the Work meets the engineering objectives set forth in such manuals. Requirements appearing in such manuals that dictate how or what should be shown on a given plan unless deemed necessary by the Concessionaire are not applicable to the Project and will be mutually agreed upon for purposes of complying with this the Agreement.
- B. Subject to the provisions of the Agreement, Work carried out during the Operating Period shall comply with the Department’s then-current Standards and Specifications including any revisions or supplements. The Concessionaire should use non-Department standards if specific

Department standards do not exist. The Concessionaire is responsible for demonstrating that any non- Department standard used conforms to Good Industry Practice and, if applicable, meets AASHTO Standards.

- C. The Concessionaire 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 1.5a. The Concessionaire shall convert metric units to English units, as applicable.
- D. When a provision of “Division 1 – General Provisions” of the *2007 Road and Bridge Specification* is applicable, Attachment 1.5b of the Technical Requirements shall apply.

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 (2008)*, the *Virginia Department of Transportation Road and Bridge Specifications (2007)* including Supplemental Specifications, Special Provisions, Special Provision Copied Notes, and supplementary documents listed in Attachment 1.5a are part of the 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. 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
 - 3. Special provisions
 - 4. Supplemental specifications
 - 5. Standards and Specifications listed in Attachment 1.5a
 - 6. Reference documents listed in Attachment 1.5a
 - 7. Standard Drawings (calculated dimensions, unless obviously incorrect, will govern over scaled dimensions)
- 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 guides applicable for the Construction Period shall be the version of those documents as listed in Attachment 1.5a or those in effect as of August 15, 2011, 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. It is the responsibility of the Concessionaire to ensure that all relevant standards and specifications have been applied.

1.6 Right of Way

- A. Right-of-way land costs will be handled as an allowance in accordance with the Agreement.
- B. The Concessionaire shall provide right-of-way (ROW) acquisition services for the Project, as required by the Agreement. ROW acquisition services shall include the preparation of ROW plans/plats in accordance with VDOT Location and Design policies and procedures, title examinations, appraisal, appraisal review, negotiations, relocation assistance and advisory services, closings, and legal services. The Concessionaire will coordinate and determine required right-of-way for Utility Relocations and coordinate preparation of all required easement agreements, right-of-way plans and documentation for acquisition and vacation of existing property rights. All appraisers and acquisition firms shall be selected from the Department's pre-approved lists. The Department will retain authority for approving just compensation, relocation benefits, and settlements. The Department must issue a Notice to Commence Right of Way Acquisition to the Concessionaire before any offers are made to acquire property. The required right-of-way plans and documentation will be reviewed and approved by the Department and, if necessary, FHWA.
- C. The Concessionaire shall carry out its responsibilities in accordance with the following requirements:
 - 1. The Concessionaire shall acquire property in accordance with all applicable 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 33.1 of the 1950 Code of Virginia, as amended. The acquisition of property shall follow the guidelines as established by the Department and other state

and federal guidelines that are required and *VDOT's Right of Way Manual of Instructions, 3rd Edition, dated 1/1/11.*

2. The Concessionaire shall submit a project-specific ROW Acquisition and Relocation Plan for the Department's review and approval. In the event the Department fails to respond in 21 days, such failure by the Department shall not be deemed approval of the ROW Acquisition Plan.
3. The Concessionaire shall submit, as part of the ROW Acquisition and Relocation Plan, procedures for handling ROW acquisitions and relocations to the Department for review and approval before beginning ROW activities. These procedures must show the Concessionaire's methods, including the appropriate steps and workflow required for title examinations, appraisals, and review of appraisals, negotiations, acquisition, and relocation. The Department shall have a period of twenty-one (21) days to review and either approve or refuse said documents, submittals including its review and approval of just compensation, relocation benefits, and administrative settlements.
4. The Concessionaire shall have access to, and use the Department's ROW and Utilities Management System (RUMS) to manage and track the acquisition process. All entries made into RUMS shall be made in a timely manner to accurately reflect current project status. The Department's standard forms and documents, as found in RUMS, will be used to the extent possible. Any changes to the forms and documents must be approved by the Department. The Department will provide training and technical assistance to the Concessionaire in the use of RUMS.
5. The Concessionaire shall provide a current title examination (no older than 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 title company, in accordance with *VDOT's Right of Way Manual of Instructions, 3rd Edition, dated 1/1/11* and shall include title insurance commitment. Should the Concessionaire select a law firm to certify title examinations, the certifying attorney shall provide evidence of professional liability insurance. The Department reserves the right to determine if the professional liability insurance coverage is sufficient. If any title examination report has an effective date that is older than 60 days, an update is required before making an initial offer to the landowner.

6. The Concessionaire shall prepare appraisals in accordance with *VDOT's Right of Way Manual of Instructions, 3rd Edition, dated 1/1/11*.
7. The Concessionaire shall provide appraisal reviews complying with technical review guidelines of the Department's appraisal guidelines. The reviewer shall be on the Department's approved fee appraiser list. The Department will review the Concessionaire's appraisal waiver, appraisal, and appraisal review for each parcel, and shall have the decision of final approval of each appraisal and just compensation offer.
8. The Concessionaire shall make direct payments to property owners for negotiated settlements and relocation benefits and make deposits with the appropriate court for condemnation cases. Payment documentation is to be prepared and submitted with the Acquisition Report (Form RW-24).
9. The Concessionaire 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. For all property purchased in conjunction with the Project, title will be acquired in fee simple, except that, with the Department's prior written approval, permanent easements may be acquired in lieu of fee simple interest for the construction, maintenance, and use of items such as sound walls, retaining walls, storm drainage structures, and earthen slopes. All property shall be conveyed to "Commonwealth of Virginia, Grantee" by a Department-approved general warranty deed, free and clear of all liens and encumbrances except encumbrances expressly permitted in writing by the Department in advance. 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 unless they are acquired by eminent domain in which case they will be acquired in the name of the Commonwealth of Virginia.
10. The Concessionaire shall use its best efforts to settle claims with landowners amicably. The Department shall make the ultimate determination in each case as to whether settlement is appropriate or whether the filing of a condemnation action is necessary. The Concessionaire shall not request the filing of a certificate until the landowner has been given a minimum of 30 days to consider the offer or terminate the negotiations. If, despite the Concessionaire's best efforts, it is unable to reach a

settlement with any landowners, as a last resort the Department will handle any necessary condemnation proceedings subject to the following. Prior to the Department filing a condemnation proceeding, the Concessionaire shall prepare or cause to be prepared all necessary paperwork and supporting documentation required for the proceeding and it shall deliver that documentation to the Department, including the notice of filing certificate. The Department will review the submitted documentation for compliance with the Department's rules and regulations, and when approved, will then file the condemnation proceeding(s) and handle such proceeding(s) in accordance with *VDOT's Right of Way Manual of Instructions, 3rd Edition, dated 1/1/11*.

11. The Office of Attorney General, Commonwealth of Virginia, shall act as the Department's legal counsel and will assign cases to fee counsel and review and approve their billing. Support and testimony for condemnations will be provided by the Concessionaire for a period of 12 months after the final condemnation certificate of take/deposit is recorded.
12. The Concessionaire shall be responsible for all contacts with landowners for ROW or construction items, prior to initiation of condemnation proceedings by the Department. The Concessionaire will provide documentation of all contact with property owners (including participants and organizations), a summary of discussions, agreed upon items, follow-up activities, and copies of items distributed, including but not limited to appropriate and timely documentation in the RUMS.
13. The Concessionaire shall use reasonable care in determining whether there is reason to believe that property to be acquired for rights of way 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 Concessionaire shall notify VDOT within three (3) days. The Concessionaire shall not proceed with acquiring such property until they receive written notification from VDOT.
14. During the acquisition process and for a period of three years after the later of Final Acceptance or the Commonwealth of Virginia has indefeasible title to the property, all Project documents and records not previously delivered to the Department, including design and engineering costs, construction costs, costs of acquisition of ROW, and all documents and records necessary to determine compliance

with the laws relating to ROW Acquisition and the costs of relocation of Utilities shall be maintained and made available by Concessionaire to the Department and FHWA for inspection or audit.

- D. The Concessionaire shall be responsible, at its sole expense, for demolishing and disposing of all existing buildings from the ROW and permanent and temporary easements. All such work shall comply with the Standard of Care and these Technical Requirements.
- E. The Concessionaire will exercise the Standard of Care to minimize impacts and damages to property, businesses, and residences, including noise, vibrations, temporary traffic patterns, and clearing of tree buffers. The Concessionaire will address public, business, and government comments in coordination with the Department within 21 days of receipt; however, the responsibility to coordinate and address the comments will be the Concessionaire's. Where requested, the Concessionaire will provide stakeout and marking of existing property lines and impacts.
- F. The Concessionaire shall acquire associated permanent easements to, or lease for, the Concessionaire's HOT Operations Center (HOT-OC) pursuant to the Agreement.

1.7 Utilities

1.7.1 General Requirements

- A. This is a VDOT sanctioned project and the Concessionaire 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. Thirty (30) Days prior to execution of the Comprehensive Agreement, the Concessionaire shall submit for review and approval by VDOT a Utility Plan, which details the schedule and proposed activities of the Concessionaire 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 from time to time as additional information becomes available during later stages of design, and includes, but is not limited to, assertions of the following:
 - 1. Durations and schedules for planned utility relocations have been coordinated with the Utility Owners.
 - 2. Durations for the utility relocations by Utility Owners are adequate for the type and scope of services being provided.

3. The use of Float for utility relocation activities is in accordance with the Technical Requirements.
- C. The coordination, design, and relocation of all utilities shall comply with these Technical Requirements and the standards and specifications set forth in Attachment 1.5a. Additional Work required due to changes in utility owners' requirements shall be at the Concessionaire's risk.
 - D. The Concessionaire shall be responsible for coordinating the Project construction with all utilities that may be affected (including the Department's communications and power cables and conduits). The Concessionaire shall be responsible for coordinating the work of its Contractors, its subcontractors, and the various utilities. The resolution of any conflicts between Utilities and the construction of the Project shall be the responsibility of the Concessionaire. No additional compensation or time will be granted for any delays, inconveniences, or damage sustained by the Concessionaire or its subcontractors due to interference from utilities or the operation of relocating utilities, except as set forth in the Agreement.
 - E. If the Concessionaire 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. The Concessionaire 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 Concessionaire is responsible for coordinating all necessary utility relocations and adjustments to occur in accordance with the accepted Baseline Schedule. Except as set forth in the Agreement, 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 Concessionaire's Cost.
 - G. The compensation paid to landowners for replacement land rights shall be included in the Concessionaire's cost in accordance with the allowance set forth in the Agreement.
 - H. The Concessionaire shall submit a Utilities Plan for the Department to review and approve in accordance with the Agreement. The

Concessionaire 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 Concessionaire shall develop and maintain a utility tracking report as part of the Utilities Plan.

- I. The Concessionaire shall initiate early coordination with all Utilities located within the Project limits. The Concessionaire shall identify and acquire any replacement utility easements or required right of way needs of all utilities necessary for relocation due to conflicts with the Project. The Concessionaire shall coordinate with the utility owners to obtain temporary construction easements or agreements.
- J. The Concessionaire shall provide all utilities with roadway/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 Concessionaire's design plan for preparing relocation plans and estimates. If a party other than the utility prepares relocation plans, there shall be a concurrence box on the plans where the utility signs and accepts the relocation plans as shown.
- K. The Concessionaire shall coordinate and conduct a preliminary review meeting with all affected utilities to assess and explain the impact of the Project. The VDOT Project Manager and Regional Utilities Manager (or designee) shall be included in this meeting.
- L. The Concessionaire shall schedule and conduct a utility field inspection for each project segment in accordance with the procedures set forth in the VDOT Utilities Manual. The Concessionaire will provide meeting minutes for each utility field inspection.
- M. The Concessionaire shall verify the prior rights of each utility's facilities if claimed by a Utility Owner. If there is a dispute over prior rights with a utility, the Concessionaire shall be responsible for resolving the dispute. The Concessionaire should prepare and submit to VDOT a preliminary utility status report within 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 Concessionaire shall obtain the following from each utility that is located within the Project limits:
 - 1. relocation plans including letter of "no cost" where the utility does not have a compensable right;

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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. prepare bridge attachment agreements between VDOT and the utility owner, if necessary.
- N. The Concessionaire will use a two party agreement, similar to the Master Utility Agreement (MUA) utilized 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 Concessionaire 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, similar to the MUA utilized by the Department (provided for in the Department's Utility Manual), will be the statement (with reference to CA) that this work is being performed as a Department project. Preparing all agreements relative to the utility relocation is to be between the Concessionaire and the Utility. This includes the agreements for authorization to relocate facilities as well as any reimbursement terms/agreements.
- O. The Concessionaire shall review all relocation plans to ensure that relocations comply with VDOT Utilities Manual and VDOT's Land Use Permit Regulations. The Concessionaire shall also ensure that there are no conflicts with the proposed roadway improvements, and ensure that there are no conflicts between each of the utility's relocation plans. The Concessionaire shall prepare and submit to VDOT all relocation plans. The Concessionaire is expected to assemble the information included in the relocation plans in a final and complete format and in such a manner that VDOT may approve the submittals with minimal review. The Concessionaire is expected to meet with VDOT's Regional Utilities Manager within 45 days prior to the first utility submittal to gain a full understanding of what is required with each submittal. The Concessionaire shall receive written approvals from VDOT prior to authorizing utilities to commence relocation construction. The utilities shall not begin their relocation work until authorized by the Concessionaire. Each relocation plan submitted must be accompanied by a certification from the Concessionaire stating that the proposed relocation will not conflict

with the proposed roadway improvement and will not conflict with another utility's relocation plan.

- P. 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 Concessionaire, 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.
- Q. The Concessionaire shall make all reasonable efforts to design the Project to avoid conflicts with utilities, and minimize impacts where conflicts cannot be avoided. The Concessionaire shall be responsible for ensuring that utility service interruptions are minimized.
- R. The Concessionaire will utilize Good Industry Practice to eliminate and minimize utility attachments on bridges and ensure that plan and estimates will adequately address support of excavations adjacent to roadways and potential settlement.
- S. The Concessionaire shall ensure the Utility Owners submits 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 21 days of receipt of as-built drawings and Land Use Permit applications.
- T. The Concessionaire shall be responsible for ensuring the appropriate abandonment or removal of all abandoned Utilities within the Project ROW.
- U. At the time that the Concessionaire notifies VDOT that the Concessionaire deems the Project to have reached Final Acceptance, the Concessionaire shall certify to VDOT 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 Concessionaire.
- V. The Concessionaire shall accurately show the final location of all utilities on the As-Built Plans for the Project.

1.7.2 Concessionaire's Responsibility for Utility Property and Services

- A. At points where the Concessionaire'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 Concessionaire shall cooperate with owners of Utilities so that:

1. removal and adjustment operations may progress in a timely, responsible, and reasonable manner,
 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 Concessionaire shall promptly notify the proper authority and shall cooperate fully with the authority in the restoration of service. If Utility service is interrupted, repair work 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 Concessionaire is responsible for all field markings of all Department owned utilities pursuant to the Agreement. The Concessionaire shall exercise care to prevent damage or disruption to the TMS. However, in the event the Concessionaire and/or its contractor(s) damage the TMS due to his operations, the Concessionaire shall immediately notify the McConnell Public Safety and Transportation Operations Center (MPSTOC) as well as the Department Project Manager and cease all construction operations until repairs are completed and the system is fully operational. Except as set forth in the Agreement, the Concessionaire will be responsible for all cost necessary for repair and any time impact to the project. Additionally, VDOT has an agreement with the Army Corps of Engineers (COE) to share capacity in a duct bank that also contains VDOT cable. The COE cable is in orange and orange with white stripe HDPE ducts. Do not damage those cables. If damage occurs, immediately notify the COE. Also notify the MPSTOC.
- D. The Concessionaire 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 as well as Department owned fiber optic lines are not marked by the Miss Utility. Therefore, the Concessionaire may either elect to use at his own discretion and cost VDOT on-call consultant or alternatively use competent contractor/consultant familiar with VDOT owned utilities. Moreover, the Department shall, if available, furnish the

Concessionaire with a set of “as built plans” for such markings. It is the Concessionaire sole responsibility to have these utilities marked, maintain the markings throughout the life of the project as well as assume physical and financial arrangements to have these utilities marked/re-marked. The Concessionaire will be responsible for all cost necessary for these utility markings.

- F. The Concessionaire shall determine whether other Utilities are present in addition to those identified by the Notification center report 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 any relief to which the Concessionaire may be entitled to in the Agreement, when authorized by the Department, the Concessionaire 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 Concessionaire shall comply with pertinent requirements for maintenance of traffic (“MOT”) for the Work. The Concessionaire is responsible for safety of work zone. The Concessionaire shall appoint a single point of contact to address MOT and safety requirements for the work zone.
- B. The Concessionaire 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, local residents, businesses, and commuters.
- C. The Department will provide a Transportation Management Plan (“TMP”) consistent with Instructional and Information Memorandum IIM-LD-241.3 (Work Zone Safety and Mobility) and TE 351.1 on Work Zone Speed Analysis. The TMP will be adopted for MOT on the Project.

- D. MOT development shall be consistent with the Agreement, including these Technical Requirements.

1.8.2 Work Hours

- A. The Concessionaire 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 Concessionaire 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 Concessionaire is advised of 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 Section 1.8.6 - Allowance for Additional Lane Closure Restriction by the Department and/or Concessionaire Request for Additional Lane Closures.

Table 1.8a Roadway Lane and Shoulder Closures			
Roadway Section	Single-Lane Closures or shoulder**	Multiple-Lane Closures	Complete Road Closure*
Interstates	M, Tu, W, Th	M, Tu, W, Th	M, Tu, W, Th
NORTHBOUND 95/395 SOUTHBOUND 395 including interchanges and associated ramps Does not include the I-95/395 reversible facility	9:30 a.m. to 3:30 p.m.	10:30 p.m. to 5:00 a.m.	12:00 a.m. to 5:00 a.m.
	9:30 p.m. to 5:00 a.m.		F
	F	F	11:00 p.m. to 7:00 a.m.
	9:00 a.m. to 12:00 noon	11:00 p.m. to 9:00 a.m.	Sa
	10:00 p.m. to 9:30 a.m.	Sa	11:00 p.m. to 9:00 a.m.
	Sa	10:00 p.m. to 9:00 a.m.	Su
	9:30 p.m. to 9:00 a.m.	Su	11:00 p.m. to 5:00 a.m.
	Su	10:30 p.m. to 5:00 a.m.	
	9:30 p.m. to 5:00 a.m.		
Interstates	M, Tu, W, Th	M, Tu, W, Th	M, Tu, W, Th
SOUTHBOUND 95	8:00 a.m. to 2:00 p.m.	10:30 p.m. to 5:00 a.m.	12:00 a.m. to 5:00 a.m.

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Table 1.8a Roadway Lane and Shoulder Closures			
Roadway Section	Single-Lane Closures or shoulder**	Multiple-Lane Closures	Complete Road Closure*
including interchanges and associated ramps Does not include the I-95/395 reversible facility	9:30 p.m. to 5:00 a.m. F 8:00 a.m. to 11:00 10:00 p.m. to 9:30 a.m. Sa 9:30 p.m. to 9:00 a.m. Su 9:30 p.m. to 5:00 a.m.	F 11:00 p.m. to 9:00 a.m. Sa 10:00 p.m. to 9:00 a.m. Su 10:30 p.m. to 5:00 a.m.	F 11:00 p.m. to 7:00 a.m. Sa 11:00 p.m. to 9:00 a.m. Su 11:00 p.m. to 5:00 a.m.
Major Arterials	M, Tu, W, Th, 9:30 a.m. to 3:30 p.m. 9:00 p.m. to 5:00 a.m. F 9:30 a.m. to 12:00 noon 9:30 p.m. to 9:30 a.m. Sa 9:30 p.m. to 9:00 a.m. Su 9:30 p.m. to 5:00 a.m.	M, Tu, W, Th 10:00 p.m. to 5:00 a.m. F 10:30 p.m. to 7:00 a.m. Sa 10:00 p.m. to 9:00 a.m. Su 10:00 p.m. to 5:00 a.m.	M, Tu, W, Th 11:00 p.m. to 5:00 a.m. F 11:00 p.m. to 7:00 a.m. Sa 10:00 p.m. to 9:00 a.m. Su 10:00 p.m. to 5:00 a.m.
All Other Roadways***	M, Tu, W, Th, 9:30 a.m. to 3:30 p.m. 9:00 p.m. to 5:00 a.m. F 9:30 a.m. to 12:00 noon Sa 9:30 p.m. to 9:30 a.m.	M, Tu, W, Th 10:00 p.m. to 5:00 a.m. F 10:30 p.m. to 9:00 a.m. Sa 10:00 p.m. to 9:00 a.m.	M, Tu, W, Th 10:00 p.m. to 5:00 a.m. F, 10:30 p.m. to 7:00 a.m. Sa 10:00 p.m. to 9:00 a.m.

Table 1.8a Roadway Lane and Shoulder Closures			
Roadway Section	Single-Lane Closures or shoulder**	Multiple-Lane Closures	Complete Road Closure*
	Su 9:30 p.m. to 5:00 a.m.	Su 10:00 p.m. to 5:00 a.m.	Su 10:00 p.m. to 5:00 a.m.

*Complete Road Closures: 30 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 with the exception of Telegraph Road at Quantico Marine Corps Base which may be closed to all traffic for a nine-month period.

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

*** Other roadway closures will require coordination and possibly permitting with the agency having jurisdiction over the roadway. Major arterials are defined as primary routes and all other routes that connect directly to Interstate I-95 and/or I-395 and/or I-495.

1.8.4 Temporary Roadway Closures in the Reversible HOV Facility

- A. The existing reversible facility hours of operations (set forth in Table 1.8b) shall remain in place during of the Construction Period, unless otherwise specified by the Department with adequate advance notice to the Concessionaire. During the Construction Period, the Department shall be responsible for the operation of the existing reversible facility, including gate operations and reversal of the flow of traffic.

Table 1.8b Reversible Facility Hours of Operations Monday – Thursday & Friday (until 6:00 p.m.)	
2:00 a.m. – 6:00 a.m.	Open to all Traffic – Northbound
6:00 a.m. – 9:00 a.m.	Open to HOV-3 Only – Northbound
9:00 a.m. – 11:00 a.m.	Open to all Traffic – Northbound
11:00 a.m. – 1:00 p.m.	Closed for Reversal Operations
1:00 p.m. – 3:30 p.m.	Open to all Traffic – Southbound
3:30 p.m. – 6:00 p.m.	Open to HOV-3 Only – Southbound
6:00 p.m. – 12:00 a.m.	Open to all Traffic – Southbound
12:00 a.m. – 2:00 a.m.	Closed for Reversal Operations
Friday Evening – Saturday – Sunday	
6:00 p.m. Fri – 2:00 p.m. Sat	Open to all Traffic – Southbound
2:00 p.m. Sat – 4:00 p.m. Sat	Closed for Reversal Operations
4:00 p.m. Sat – 6:00 a.m. Mon	Open to all Traffic – Northbound

- B. The roadway closures listed in Table 1.8c shall be permitted in the reversible roadway within the project limits during the Construction Period. These closure periods are subject to change in case of major

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incidents and /or special events. If adjustments to these periods are required to accommodate seasonal variations in traffic, the Department will notify the Concessionaire in writing 30 days in advance and these adjustments shall be handled under Section 1.8.6 - Allowance for Additional Lane Closure Restriction by the Department and/or Concessionaire Request for Additional Lane Closures.

Table 1.8c Reversible Facility Roadway Lane Closures	
Monday - Thursday	
9:30 a.m. – 3:00 p.m.	Single Lane Closures Permitted (a)
8:00 p.m. – 5:00 a.m.	Single Lane Closures Permitted (a)
8:00 p.m. – 5:00 a.m.	Full Closure Permitted (b)
Friday - Sunday	
9:00 a.m. – 12:00 noon Fri.	Single Lane Closures Permitted (a)
11:00 p.m. Fri. – 5:00 a.m. Mon.	Single Lane Closures Permitted (a)
11:00 p.m. Fri. – 10:00 a.m. Sat.	Full Closure Permitted (c)
11:00 p.m. Sat – 10:00a.m. Sun	Full Closure Permitted (c)
11:00 p.m. Sun – 5:00a.m. Mon	Full Closure Permitted (d)

(a) No daytime closures Monday-Friday will be permitted on the I-395 Reversible Lane Facility inside the Capital Beltway

(b) All gate operations and/or reversal of traffic must happen within permitted closure periods only. The start of the gate operation to open the facility must begin by 4:00 a.m. If the facility is not cleared to be open to traffic by 4:00 a.m., unless approved by the Department, all associated Lane Closure Damages will be assessed beginning at 4:01 a.m. as stipulated in Table 1.8e. The Department will start closing the gate for reversible lanes starting at 8:00 p.m. Monday thru Thursday, once requested by the Concessionaire in an expeditious manner. If the Department has not closed the gates by 9:00 p.m., Concessionaire shall be entitled to additional time in accordance with the Agreement. The Concessionaire may choose to close the gates for the reversible lanes (partial or full) by their means, once TCP are submitted and approved by the Department.

(c) All gate operations and/or reversal of traffic must happen within permitted closure periods only. The start of the gate operation to open the facility must begin by 9:00 a.m. If full closures are performed logical entry and exit points off of the facility should remain open so as not to trap vehicles. If the facility is not cleared to be open to traffic by 9:00 a.m., unless approved by the Department, all associated Lane Closure Damages will be assessed beginning at 9:01 a.m. as stipulated in Table 1.8e. The Department will start closing the gate for reversible lanes starting at 11:00 p.m. Friday & Saturday, once requested by the Concessionaire in an expeditious manner, but in no way guarantee that the reversible lanes will be closed by 12:00 a.m. and shall not be responsible for any delays and damages. The Concessionaire may choose to close the gates for the reversible lanes (partial or full) by their means, once TCP are submitted and approved by the Department.

(d) All gate operations and/or reversal of traffic must happen within permitted closure periods only. The start of the gate operation to open the facility must begin by 4:00 a.m. If full closures are performed logical entry and exit points off of the facility should remain open so as not to trap vehicles. If the facility is not cleared to be open to traffic by 4:00 a.m., unless approved by the Department, all associated Lane Closure Damages will be assessed beginning at 4:01 a.m. as stipulated in Table 1.8e. The Department will start closing the gate for reversible lanes starting at 11:00 p.m. Sunday, once requested by the Concessionaire in an

expeditious manner, but in no way guarantee that the reversible lanes will be closed by 12:00 a.m. and shall not be responsible for any delays and damages. The Concessionaire may choose to close the gates for the reversible lanes (partial or full) by their means, once TCP are submitted and approved by the Department.

1.8.5 Lane Closure Types

- A. The Concessionaire 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.
- B. The lane closure approval and coordination process shall conform to the requirements of the Department.
- C. Type 1 – A lane closure resulting in a significant impact on traffic, such as stopping traffic completely, closing two or more lanes, any lane closures in the existing reversible facility, 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 PIP.
- D. Type 2 – A lane closure resulting in minor or no impact on the flow of traffic, such as closing one lane on a four-lane roadway during off-peak traffic hours.
- E. Type 3 – A lane closure that would close a shoulder (right or left) on a roadway or ramp.
- F. Table 1.8d lists the advance notices required for each type of lane closure or independent pedestrian bridge closure.

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

- G. 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.
- H. Confirmation 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 Concessionaire 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.

- I. Traffic backups must dissipate before successive closings can be implemented.
- J. The minimum clear distance between two separate lane closings, that is, 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.
- K. Lane closures or work that impacts traffic flow will not be permitted on September 11, Inauguration Day and holidays from noon the day before a holiday until noon the day after a holiday, unless approved by the Department. When a holiday falls on a Friday, lane closures are not permitted from noon on Thursday to noon on Monday. When a holiday falls on Monday, lane closures are not permitted from noon on Friday to noon on Tuesday. Further, because the Thanksgiving Day holiday occurs on a Thursday, work will not be permitted from 3:30 p.m. on Tuesday until 9:30 a.m. on the following Monday. In addition, because Easter holiday occurs on a Sunday, work will not be permitted from noon on Friday until 9:30 a.m. Monday.
- L. For the purposes of these Technical Requirements, the term “holiday” herein 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 Section 1.8.6, Allowance for Additional Lane Closure Restriction by the Department and/or Concessionaire Request for Additional Lane Closures.
- M. Extension of a lane closure time, except as approved by the Department, is not acceptable and bears a liquidated damage charge. The liquidated damage charges 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

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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.

- N. The liquidated damage charges for failure to restore all lanes to traffic by the designated times are defined in Table 1.8e:

Table 1.8 e Liquidated Damages for Lane Closures			
Liquidated damage (\$ per minute)			
Elapsed Time (min)	I-95, I-395, I-495, and all ramps	Major Arterials	All other roads
1-5, or any portion thereof	\$0	\$0	\$0
Every additional minute or any portion thereof after initial 5 minutes stated above	\$1000 plus \$2,500 per additional minutes	\$1000 plus \$1,500 per additional minutes	\$500 plus \$500 per additional minutes

The liquidated damage charges are set forth in the table 1.8 e. If a Non-Permitted Closure occurs, the Department will notify the Concessionaire thereof and of the amount of associated Lane Closure Damages in writing within 48 hours of the Non-Permitted Closure. If there are no additional Non-Permitted Closures occurring within 90 days, the Department shall refrain charging of the Lane Closure Damages for the prior Non-Permitted Closures. Otherwise, the Concessionaire shall pay all Lane Closure Damages to the Department within 30 days of the date on which last written notice of Lane Closure Damages is given to the Concessionaire for violating having two (2) or more Non-Permitted Closure occurrences within 90 days. Once there is a clean period of 90 days without a Non-Permitted Closure occurrence, the new 90 days period will start for future Lane Closure Damages. All liquidated damage charges will be capped at \$200,000 per violated Non-Permitted Closure.]

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

- O. Where the Concessionaire causes the assessment of the liquidated damages for failure to restore traffic lanes, and depending upon the severity (15 minutes delays opening and/or more than two delay incidents in one week) of the closure violations as determined by the Department, the Concessionaire will not be allowed further lane closures until the reasons for the assessment are evaluated and the Concessionaire can provide assurance that the causes have been corrected.
- P. 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 Section 1.8.6 – Allowance for Additional Lane Closure Restriction by the Department and/or Concessionaire Request for Additional Lane Closures.

1.8.6 Allowance for Additional Lane Closure Restriction by the Department and/or Concessionaire Request for Additional Lane Closures

- A. At the Department’s reasonable discretion and approval, the Concessionaire 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 Tables 1.8a and 1.8c 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. Concessionaire acknowledges that there will be instances where the Concessionaire may not be allowed to implement an approved lane closure during events that are beyond the Department’s control.
 - 4. The Department will track all instances where the Concessionaire is directed by the Department not to implement any lane closures for special events such as, but not limited to, the following list:
 - i. Presidential motorcades traveling through project limits
 - ii. Special events with regional impacts
 - iii. Special sport events with regional impacts
 - iv. Major accidents/incidents with regional impacts
 - v. Holiday and/or seasonal traffic patterns
- E. Calculating Hours:
 - 1. Additional time (lane closures) – Any additional time requested by the Concessionaire and granted by the Department beyond

the approved hours within the Agreement will be added for every instance and every location at 15 minutes intervals.

2. Additional Time (complete closures) – If a full closure of roadway not specified in the Agreement is implemented in lieu of 30 minute total temporary closure, hours will be calculated in the same manner as the hours that were requested/approved for the specific closure.
3. Time Deducted – When the Concessionaire 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 60 days, the Department and Concessionaire will develop and agree on a format of documenting this 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 Concessionaire will reconsolidate and agree on the resultant amount of hours allowed/disallowed.

G. Allowance:

1. At the end of the project, the Department and the Concessionaire will reconcile the resultant impacted time or additional granted time by subtracting the additional time granted by the Department from the time Concessionaire was disallowed per the Technical Requirements in accordance with the Agreement to implement the lane closures. The Department and the Concessionaire 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 snow removal process, emergency VDOT maintenance repairs safety shutdowns and from major accidents are not subject to above allowance and are excluded from the calculations and compensations.

H. General

Notwithstanding anything to the contrary, it is agreed that:

1. The Department will provide the Concessionaire with as much notice as is possible with respect to any lane closure request by the Concessionaire which is not approved by the Department.
2. The Concessionaire will provide the Department with as much notice as is possible with respect to any inability of the Concessionaire to implement lane closures which are otherwise allowed within the Agreement.
3. If the Department disapproves requests for lane closures from Concessionaire, or otherwise prevents Concessionaire from implementing lane closures which are otherwise permitted by the Agreement, and the impact of such actions by the Department is more than 120 cumulative hours, such actions shall constitute a Department Change.

1.8.7 Night Work

- A. In areas where Work is to be performed during the hours of dusk or darkness, the Concessionaire 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 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 Concessionaire shall furnish and place warning signs to alert approaching motorists of lighted construction area(s). These warning signs shall be four feet (1200 mm) x four feet (1200 mm). The Concessionaire's vehicles used on the Project shall be provided with amber flashing lights that shall be in operation while in the work area. The Concessionaire's equipment shall be provided with a minimum of three square feet of reflective sheeting that is visible to approaching motorists. The Concessionaire shall provide his personnel with reflective vests, which shall be worn at all times while the workers are within the work area. The Concessionaire shall provide a light meter to demonstrate that the minimum light intensity is being maintained.
- D. The Concessionaire shall provide sufficient fuel, spare lamps, generator, etc., to maintain the lighting of the work site. The Concessionaire shall utilize 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 Law.

- E. The Concessionaire shall provide sufficient uniformed law enforcement officers with a marked law enforcement vehicle equipped with a blue flashing light for all nighttime work that is performed within the travel lanes.

1.8.8 Allowance for Law Enforcement Utilization

- A. It is understood by all parties that the Concessionaire will work with and comply with the direction of the Department to determine the use of law enforcement. It is also understood there is an estimated budget of \$1,392,300 representing the cost without markup to be used for the cost of law enforcement. Any estimated budget dollars remaining upon substantial completion of the project will be credited to the Department, plus 18% markup. Any amount spent above this estimated budget will be paid to the Concessionaire at cost, without a markup. The law enforcement utilization in lieu of using flag persons will be excluded from the total cost. Upon Substantial Completion of the Project, the Department and the Concessionaire will reconcile the total cost of law enforcement utilized during the life of the Project.

1.8.9 Size and Weight Limitations

- A. **Hauling or Moving Material and Equipment on Public Roads Open to Traffic:** The Concessionaire shall comply with legal size and weight limitations in the hauling or moving of material and equipment on public roads open to traffic unless the hauling or moving is covered by a hauling permit.
- B. **Hauling or Moving Material and Equipment on Public Roads Not Open to Traffic:** The Concessionaire shall comply with legal weight limitations in the hauling or moving of material and equipment on public roads that are not open to traffic unless the hauling or moving is permitted elsewhere herein or is otherwise covered by a hauling permit. The Concessionaire shall be liable for damage that results from the hauling or moving of material and equipment.
- C. The hauling or moving of material and equipment on the final road surface or across any structure during various stages of construction shall be subject to engineering analysis and approval by the Department.
- D. **Furnishing Items in Component Parts of Sections:** If the size or weight of fabricated or manufactured items together with that of the hauling or moving vehicle exceeds the limitations covered by hauling permit policies and other means of transportation are not available,

permission will be given to furnish the items in component parts of sections with adequately designed splices or connections at appropriate points. Permission for such adjustments shall be requested in writing, and approval in writing shall be secured from the Department prior to fabrication or manufacture of the items. The request shall state the reasons for adjustment and shall be accompanied by supporting data, including working drawings where necessary.

1.8.10 Use of Explosives

- A. Explosives shall be stored and used in a secure manner in compliance with Good Industry Practice. Prior to prosecuting the Work, the Concessionaire shall conduct an on-site review of the work involved and develop a plan of operations for performing excavating work. Where feasible, the Concessionaire shall explore other means of loosening and or reducing the size of the excavation without blasting. When blasting becomes necessary, the Concessionaire'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 Concessionaire shall be responsible for damage resulting from the use of explosives. The Concessionaire 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 Concessionaire's plan of operations, blasting plan, and notification of property owners shall in no way relieve the Concessionaire of its responsibility for damage resulting from its blasting operations.

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 Concessionaire shall provide an 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/community outreach staff and the Department;
 - 4. Implement traffic management strategies; and
 - 5. Be continuously available during construction until Final Acceptance of the Project and elimination of all construction traffic control.

- D. Unless otherwise approved by the Department, the MOT engineer shall be a Professional Engineer registered in the Commonwealth of Virginia who has at least 5 years of MOT design and implementation experience or an individual demonstrating a minimum of 10 years of experience in managing MOT design and implementation 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/hers possession.

- E. The Concessionaire 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 Concessionaire shall use analytical/deterministic (HCM-based) or traffic simulation/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.

1.9.2 MOT During Construction

- A. The MOT engineer or designee shall be continuously available for MOT related activities during construction until Final Acceptance and elimination of all construction traffic control.
- B. 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-241.4 (Work Zone Safety and Mobility) and TE 351.2 on Work Zone Speed Analysis will be adopted for MOT on the Project.
- C. The Concessionaire shall maintain traffic consistent with the agreed upon Transportation Management Plan.
- D. The Concessionaire shall conduct daily and weekly MOT inspection to ensure all traffic devices and traffic patterns are in compliance with the VWAPM and MUTCD standards. Provide a weekly MUTCD report to the Department to include the following:
 - 1. Date discrepancy was identified
 - 2. Description of discrepancy
 - 3. Corrective action required
 - 4. Date corrective action should be taken
 - 5. Date corrective action was completed
- E. The Concessionaire shall develop Temporary Traffic Control Plans (TCP) for each stage of construction that shows the Concessionaire's proposed construction staging and proposed traffic control devices consistent with the MOT Plan.
- F. The Concessionaire, at its sole cost and expense, will be required to provide a uniformed law enforcement officer with a marked law enforcement vehicle equipped with a blue flashing light during set-up and take-down of all daytime intersection closures involving two or more lanes of traffic.
- G. Detour plans shall be developed by the Concessionaire and presented to the Department for approval. The Concessionaire shall coordinate detour plans with local, state and federal agencies (as applicable) and submit and update the MOT Plan well in advance of any planned detour activity. The Concessionaire 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 Right of Way. The provision of detours and marking of alternate routes will not relieve the Concessionaire of the responsibility for ensuring the safety of the public or from complying with any requirements of the Agreement.

- H. Right of way 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 Concessionaire.
- I. During any suspension of Work, the Concessionaire shall temporarily open to traffic such portions of the Project and temporary roadways as may be agreed upon by the Concessionaire 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 Virginia Work Area Protection Manual (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. Restrictions on lane closures are defined in the Agreement.
- M. 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.
- N. Where concrete barriers are used to close the shoulder, the Concessionaire will be required to provide pull off areas as mutually agreed.
- O. 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.

- P. The Concessionaire shall schedule construction operations so that approved continuous access is provided for all roads and properties. Connections or entrances shall not be disturbed by the Concessionaire 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 there are delays 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/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.
- Q. When the Concessionaire 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.
- R. 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 three feet from the edge of the paved surface.

- S. Where the Concessionaire 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 Concessionaire 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 Concessionaire damage an existing traveled roadway, the Concessionaire shall cease operations and repair damages.
- T. Where existing hydraulic cement concrete pavement is to be patched, the operation of breaking and excavating old pavement shall extend for a distance of not more than two miles. Patching shall be coordinated with excavating so that an area of not more than one-half mile in which excavated patches are located shall be left at the end of any day's work. Necessary precautions shall be taken to protect traffic during patching operations.
- U. The Concessionaire 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
- V. If the Concessionaire fails to remedy unsatisfactory maintenance not complying with these Technical Requirements within a mutually agreed upon time after receipt of a written notice by the Department, the Department may proceed with adequate forces, equipment, and material to maintain the project. Any compensation will be in accordance with the Agreement. The Concessionaire shall have the right to dispute the Department's determination that maintenance is unsatisfactory.

1.9.3 MOT During Operation for Routine Maintenance and Major Rehabilitation Maintenance Work

- A. **Lane/s and Shoulder/s Closures:** To facilitate construction and minimize inconvenience to the public for the routine maintenance and for major rehabilitation maintenance work, the Concessionaire is advised of the closure limitations listed in Attachment 1.9 – VDOT Policy for Lane Closure in NoVA District, dated April 27, 2012, as updated at the time of actual lane closure limitations or lane closures limitations mutually agreed between the Department and the

Concessionaire. Both the Concessionaire and the Department will coordinate and mutually agree the requirements for lane closures of the Project Assets and the GP Lanes to facilitate the routine and major rehabilitation maintenance work.

1.10 Reporting During Operating Period

- A. The Concessionaire shall prepare and provide to the Department regular reports during the Operating Period (as more fully described below). All reports prepared by Concessionaire shall include, at a minimum, those items shown below in a format mutually agreed to with the Department and sufficient to allow the Department to meet its regulatory reporting responsibilities.
- B. During the Operating Period, the Concessionaire's quarterly O&M report shall be mutually agreed to with the Department and may include the following:
 - 1. planning and implementation of operations, including work plans for the future periods;
 - 2. roadway operations;
 - 3. incident response;
 - 4. routine maintenance activities;
 - 5. customer service log, detailing complaints or requests, and their disposition;
 - 6. O&M inspections;
 - 7. Long-term participation SWaM goal;
 - 8. a summary of issues related to Performance Points during the reporting period;
 - 9. quality management activities; and
 - 10. performance timeliness.
- C. During the Operating Period, the Concessionaire's annual report shall include the following:
 - 1. Summary of quarterly issues and trends as required for the Department's reporting to FHWA;
 - 2. annual budget(s), as required by the Agreement; and

3. a report on the O&M Overhead Costs of the O&M Contractor or its Affiliates.
- D. The Concessionaire Management Plan shall describe the proposed formats, means of distribution, and recipients of the reports.
- E. The Concessionaire 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 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).

1.11 Third Parties and Permitting

1.11.1 Permitting

- A. The Concessionaire shall coordinate in its dealings with Governmental Authorities and other entities having interests in the Project, with assistance from the Department as reasonably requested. All Government Approvals applicable to construction Work will be the responsibility of the Concessionaire. The Concessionaire shall provide copies of all permits and permit modifications to the Department upon receipt.
- B. The Concessionaire 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 Concessionaire in obtaining any such waiver or variance. The Concessionaire shall adhere to the requirements of the noise waiver in planning and performing any construction. If the city or county identifies a violation all costs associated with any delays or corrective action is the responsibility of the Concessionaire.
- C. Concessionaire will be responsible for all costs associated with compliance with any ordinance and Law or any violations of Law attributed to the activities of the Concessionaire in accordance with the Agreement.

1.11.2 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 Concessionaire shall cooperate with the appropriate officials and agents in the prosecution of the Work to the same extent as with the Department.

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- B. The Concessionaire shall coordinate its activities with other contractors working in the area. As provided in the Agreement, the Concessionaire's work program and schedule shall consider and coordinate with the work of other contractors 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 PPTA, that affect the Concessionaire's work, including work related to abutting roadways and connectors and work associated with a TAMS contract, the Concessionaire will coordinate its work with the work being performed by the other contractors. The Department shall contractually require its separate contractors to cooperate with, and coordinate their activities with, the Concessionaire.
- D. The Concessionaire shall be responsible for contacting other contractors regarding their anticipated schedules to complete the associated projects or key milestones of the associated projects they are/will be working on. These contractors are/will be working on other improvement projects such as, but not limited to, the following:
 - 1. Route 495 HOT Lanes in Virginia Project
 - 2. I-95 HOV/HOT Ramp at Fort Belvoir North (DAR)
 - 3. Seminary HOV/Transit Ramp to Link HOV Lanes on I-395 to growing Mark Center
 - 4. Department of Rail and Public Transportation Transit Improvements
 - 5. Connect Auxiliary Lane on I-395 NB between Duke St. & Seminary Rd.
 - 6. RTE 395 - Widening HOV Off Ramp to 2 lanes
 - 7. I-95 Left Shoulder Upgrade in Prince William (from Occoquan River to Dumfries)
 - 8. Auxiliary Lane on I-95 NB @ MP 153
 - 9. Auxiliary Lane on I-95 NB @ MP 158
 - 10. Auxiliary Lane on I-95 SB @ MP 153
 - 11. VDOT Preventative Maintenance Contracts
 - 12. Trail under Joplin Rd Bridge

13. Russell Road Bridge Rehab Maintenance Contract
 14. ITS contract to install cameras on I-95 between Dumfries and Fredericksburg
- E. The Concessionaire 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.

1.11.3 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 Concessionaire's Work requires the disconnection of "in service" fire hydrants, the Concessionaire shall notify the locality's fire department or communications center at least 24 hours prior to disconnection. In addition, the Concessionaire shall notify the locality's fire department or communications center no later than 24 hours after reconnection of such hydrants.

1.11.4 Construction Over or Adjacent to Navigable Waters

- A. The Concessionaire shall be responsible for obtaining a permit from the U.S. Coast Guard for the anticipated construction activities that cross a waterway under the jurisdiction of the U.S. Coast Guard.
- B. Prior to starting demolition or construction operations the Concessionaire shall attend a coordination meeting with the Department and the U.S. Coast Guard to present its planned operations and the potential impacts those operations may pose to water traffic. The Concessionaire shall, in consultation with the U.S. Coast Guard, establish the proper protocol for emergency closures and be governed accordingly. The protocols will be confirmed in writing with the Department and the U.S. Coast Guard and incorporated in the Project Development Plans.
 1. **Activities subject to Coast Guard regulation under the Permit.** Following the U.S. Coast Guard coordination meeting, the Concessionaire shall incorporate its proposed schedule of operations as part of its Baseline Schedule. The Concessionaire shall incorporate the Department's comments and submit its notice of scheduled operations to the Department and to the U.S. Coast Guard at least 45 days prior to commencement of any permitted construction activities.

U.S. Coast Guard acceptance of the Concessionaire's written schedule of operations affecting navigable waters is a condition precedent to the Concessionaire's commencement of any construction activities.

2. **Activities that require channel closures or restrictions.** In addition to the submittal of its proposed schedule of operations as described above, Concessionaire shall submit plans that comply with the Coast Guard Permit for falsework, cofferdams, floating equipment and other obstructions to the channel or channels to the Department. The Concessionaire's attention is directed to the possibility that advance notification for consideration of approval may vary depending on the type and duration of proposed closure(s), the time of year for requested closure(s), and location of existing bridge(s) and waterway(s) involved, and the impact to entities served along or through the waterway(s).
- C. The Department shall review and provide written comments, if applicable, to the Concessionaire within 21 days following receipt of the Concessionaire's plans. The Concessionaire shall give due consideration to the Department's suggested amendments or comments and, to the extent it deems appropriate, incorporate the Department's comments and submit its plans to the Department and to the U.S. Coast Guard at least 45 days prior to commencement of any permitted construction or demolition operations. The Concessionaire may not commence activities that require channel closures or restrictions without the prior written approval of the Department and the U.S. Coast Guard. The Concessionaire shall be responsible for complying with all operational requirements that the U.S. Coast Guard may place on the Concessionaire as conditions of approval.
 - D. In addition, the Concessionaire shall request and obtain Department and U.S. Coast Guard approval in writing before commencing any operations that deviate from the Concessionaire's schedule of operations when these operations interfere or have the potential to interfere with navigation of water traffic outside of timeframes previously approved by the Department and the U.S. Coast Guard.
 - E. Notices shall be sent to the U.S. Coast Guard, Fifth District Bridge Office (OBR), 431 Crawford Street, Portsmouth, VA 23704-5004. Payment of any penalty or fine that may be levied by the U.S. Coast Guard for Concessionaire violations of bridge regulations found in 33 CFR Parts 115, 116, 117 and 118 shall be the responsibility of the Concessionaire.

1.11.5 Other Permitting for Construction In, Over and/or Adjacent to Navigable Waters

- A. Subject to the Agreement, the Concessionaire shall be responsible for obtaining any other permits required by other federal and state agencies including but not limited to the U.S. Army Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission for the anticipated construction activities that cross a waterway and/or are otherwise under the respective agency's jurisdiction. The Department shall provide assistance as needed.
- B. Prior to starting demolition or construction operations the Concessionaire shall organize and attend coordination meeting(s) with the Department and the respective agencies to present its planned operations and the potential impacts those operations may pose. The Concessionaire shall, in consultation with the agency or agencies, establish the proper protocol for permit compliance and conditions for work stoppage and be governed accordingly. The protocols shall be confirmed in writing with the Department and the agency or agencies and shall be incorporated in the Project Development Plans. The Department and agency approval is required prior to commencement of construction activities.

1.12 Emergency Services

1.12.1 Liaison

The Concessionaire shall comply with the Department requirements for participation in industry and statutory initiatives regarding emergency management, where applicable.

1.12.2 Emergencies and Extraordinary Circumstances

- A. Subject to the Agreement, the Concessionaire's response to emergencies and extraordinary circumstances as part of the Project will be in accordance with the Agreement and not inconsistent with the Department's emergency evacuation plan and shall ensure that:
 - 1. safety of motorists, pedestrians 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 GP Lanes or HOT 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 HOT Lanes;

4. if the U.S. Secret Service (USSS), in coordination with the Virginia State Police (VSP), determines movements of the President of the United States require use of the HOT Lanes, the Concessionaire shall cooperate and comply fully with USSS and VSP 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 or the NRO Director, to assume and exercise control of the HOT Lanes in part and/or in their entirety, including all applicable systems and field devices via available interfaces, pursuant to the Agreement; and
 6. the Concessionaire will, as needed, participate in emergency exercises conducted by Governmental Authorities.
- B. During special events that have significant impact on traffic flow, the Concessionaire shall designate a responsible party in charge to work with the Department's NRO Special Events and Incident Management Coordinator to develop traffic management plans for the event.
- C. Should the Concessionaire 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.

1.13 Safety

1.13.1 General Requirements

- A. The Department and the Concessionaire recognize that in every circumstance, activity, and decision related to the Project, safety of the public, Department personnel, and Concessionaire personnel is the primary concern. Ensuring and maintaining safety on the Project shall supersede any and all other objectives.
- B. The Concessionaire shall designate a full-time Project safety officer for the Term. The Project safety officer will ensure that designated Project personnel can be contacted by the Department and emergency services personnel at all times.

1.13.2 Construction Safety and Health Standards

- A. Compliance with construction safety and health standards is a condition of the Agreement, and shall be made a condition of each subcontract entered into pursuant to the Agreement. The Concessionaire and any Contractor shall not require any worker employed in performance of the Agreement to work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to their health or safety, as determined under construction safety and health standards promulgated by the U.S. Secretary of Labor in accordance with the requirements of Section 107 of the Contract Work Hours and Safety Standards Act.
- B. The Concessionaire shall comply with the Virginia Occupational Safety and Health Standards adopted under the Code of Virginia and the duties imposed under the Code. Any violation of the requirements or duties that is brought to the attention of the Concessionaire by the Department or any other person shall be immediately abated.
- C. Pursuant to the above, the Department shall comply with the safety requirements as outlined in the Health, Safety and Security Plan as prepared under the Agreement and Attachment 1.3. The Department shall ensure that proper safety training that satisfies all Law and the Health, Safety and Security Plan is provided to all relevant Department personnel before such personnel are permitted access to the Project or Project site.
 - 1. Hard hats shall be worn while participating in or observing all types of field Work when outside of a building or outside the cab of a vehicle, and exposed to, participating in or supervising construction.
 - 2. Respiratory protective equipment shall be worn whenever an individual is exposed to any item listed in the OSHA standards as needing such protection unless it is shown that the employee is protected by engineering controls.
 - 3. Adequate eye protection shall be worn in the proximity of grinding, breaking of rock and/or concrete, while using brush chippers, striking metal against metal or when working in situations where the eyesight may be in jeopardy.
 - 4. A safety vest shall be worn by all exposed to vehicular traffic and construction equipment.
 - 5. Standards and guidelines of the current *Virginia Work Area Protection Manual* shall be used when setting, reviewing, maintaining, and removing traffic controls.

6. Flaggers shall be certified in accordance with the Virginia Flagger Certification Program.
7. No person shall be permitted to position themselves under any raised load or between hinge points of equipment without first taking steps to support the load by the placing of safety bar or blocking.
8. Explosives shall be purchased, transported, stored, used and disposed of by a Virginia State Certified Blaster in possession of a current criminal history record check and a commercial driver's license with hazardous materials endorsement and a valid medical examiner's certificate. All Federal, State and local regulations pertaining to explosives shall be strictly followed.
9. All electrical tools shall be adequately grounded or double insulated. Ground Fault Circuit Interrupter (GFCI) protection must be installed in accordance with the National Electrical Code (NEC) and current Virginia Occupational Safety and Health agency (VOSH). If extension cords are used, they shall be free of defects and designed for their environment and intended use.
10. No person shall enter a confined space without training, permits, and authorization.
11. Fall protection shall be required whenever an employee is exposed to a fall six feet or greater.

1.14 Force Account

The Department will issue a Directive Letter to the Concessionaire requiring the Concessionaire to move forward with additional work on a Force Account basis, pursuant to the terms of the Agreement, when the Department and the Concessionaire cannot firmly establish an agreeable price for the work. Work performed on a Force Account basis will be compensated by way of Allocable Costs as defined in the Agreement.

2 Public Information and Communications

2.1 Public Information

2.1.1 General Requirements

The Concessionaire in collaboration with the Department shall develop the required process and procedures for media relations and public information in the form of a Communications, Consultation, Public Outreach, and Community Engagement Plan, which will be consistent with the Agreement and the requirements included in Attachment 1.3. These processes and procedures will acknowledge that there are differing responsibilities for both parties during the Work period and throughout the Operating Period.

2.1.2 Interface and Liaison with the Department

- A. Management protocols shall be developed between the Concessionaire's Project communications team and the Department's Representative. These protocols shall detail:
 - 1. a regime of regular reporting to the Department on marketing and communications activities, current and outstanding community 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. requirements in relation to Department's review and comment on 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 will be conducted in accordance with the current version of the Department's *Policy Manual for Public Participation in Transportation Projects*. The Concessionaire will conduct additional meetings, public interface and marketing activities in accordance with the Communications, Consultation, Public Outreach, and Community Engagement Plan.
- C. The Concessionaire 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 Concessionaire shall provide the Department with advance copies of project- communications materials for review and comment prior to dissemination. The Department will provide any comments in a timely fashion.

- D. The Department reserves the right to review and comment on any public communications, including publicity and branding.

2.1.3 Project Communications Team

- A. The Concessionaire shall establish a Project communications team through which all communication and public outreach activities on the Project on behalf of the Concessionaire will be coordinated.
- B. The Project communications team will include:
 - 1. a public affairs manager and adequate support staff and/or consultants, who shall have responsibility for coordinating delivery of the Public Information and Communications Plan. The public affairs manager will manage the relationship with the Department's communication team and reporting on all communications and outreach activities;
 - 2. a public information manager and adequate support staff and/or consultants, responsible for community outreach and information activities during the Work period. The public information manager will report to the Design-Build Contractor's functional management but will operate as a member of the Project communications team; and
 - 3. the Project communications team to develop and agree upon team protocols for communication between team members, incorporating measures related to notification and approval timeframes, media interface, and preparation of Project communication materials.

2.1.4 Design-Build Public Information and Involvement

- A. The Concessionaire's and the Department's communications team shall maintain an open dialogue with the stakeholders and communities immediately surrounding the Project with the objective of building a long-term relationship based on trust and respect. The Concessionaire will work with the communities to identify specific concerns and strategies for mitigation.

2.1.5 Pre-Operating Period and Operating Period – Public Engagement and Awareness

- A. No less than 180 days prior to Service Commencement the Concessionaire shall take measures to inform users to ensure that the motorists are educated about the features and benefits of the Project, so that they can make an informed choice about their use of the HOT Lanes once open to traffic.

- B. The Concessionaire shall develop a public engagement and awareness program to fit within the context of the broader Communications, Consultation, Public Outreach, and Community Engagement 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 HOT 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. interface with E-ZPass marketing and communications, to facilitate distribution of transponders to motorists who intend to use the HOT Lanes;
 - 5. education about driver information systems in use on the HOT 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. This shall include:
 - i. 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
 - ii. communication with property owners in direct impact areas.
 - 7. The Concessionaire and the Department will coordinate closely in outreach and communications to elected officials related to the Project. The project communications team will work with

project management to develop and agree upon a protocol to ensure consistent and effective communications to elected officials directly related to the Project. Both the Department and the Concessionaire will have ongoing dialogues with the elected officials and other key stakeholders.

8. coordination with local agencies; and
9. notification program to inform motorists and the broader community about expected traffic changes/delays

2.2 Media Relations

2.2.1 Media Outreach

- A. While there will be some overlap between the Parties on some communications and outreach activities during the Work period and Operating Period, The Department will serve as the sole source to the news media and community stakeholders on specific lane closures, delays, detours, and other construction-related impacts associated with the Project. The Project communications team will put processes in place to ensure close coordination with the Department on media outreach activities, issues, and responses, and will promote consistency with the Communications, Consultation, Public Outreach, and Community Engagement Plan.
- B. The Concessionaire shall:
 1. develop and provide a set of media protocols upon which the Department and Concessionaire will agree to govern responsibilities and reporting in relation to contact with the media, including guidelines for information sharing, policies to promote consistent messages, and procedures specific to managing emergencies and incidents.
 2. develop and provide to the Department for review and comment a set of media protocols within the Project team;
 3. proactively build and maintain relationships, in collaboration with the Department, with local media;
 4. provide timely response to media inquiries and keep the Department informed of media inquiries regarding the Project and the nature of responses that are documented as mutually agreed;
 5. provide relevant Project information to the media in a timely fashion;

6. monitor all media coverage of the Project; and
7. provide copies of all press releases or other media materials to the Department in advance of distribution.

2.3 Project Marketing

2.3.1 Project Branding

All public communications on the Project will be undertaken within the framework of a uniform project ‘brand’ to ensure consistency of the marketing and communications across all project phases. The branding will be developed by the Concessionaire and is subject to the Department’s review and comment.

2.3.2 Market Research and Analysis

- A. Communication, marketing, and public outreach activities will be designed to respond to the issues, attitudes, and attributes of the communities and market segments relevant to the Project.
- B. The Concessionaire shall:
 1. conduct market research as required to guide marketing and communication activities; and
 2. establish project communication benchmarks and measure and report on community awareness, attitudes, and satisfaction towards the Project.

2.4 Communities and Public Outreach

2.4.1 Integrated Communications, Consultation, Public Outreach, and Community Engagement Plan

- A. The Concessionaire shall deliver an integrated Communications, Consultation, Public Outreach, and Community Engagement Plan that:
 1. provides an effective framework for communication between the Concessionaire and stakeholders;
 2. effectively engages the community in the design, construction, and operation of the Project to minimize negative impacts and maximize positive outcomes;
 3. builds a strong and enduring relationship with stakeholders and the community within the toll facilities catchments over the life of the Project;

4. identifies and manages risks associated with the Project;
 5. develops a strong and enduring brand relationship between the community, toll facility drivers, and the owners and operators of the Project;
 6. maximizes public awareness of the features and benefits of the HOT Lanes; and
 7. ensures the public understands how best to use the HOT Lanes and the requirements for travel on the system, including congestion pricing and paying tolls, obtaining and using transponders, and user eligibility requirements.
- B. The Public Information and Communications Plan, consistent with the Department's goals for the Project, will be presented to the Department for review and comment and will form the basis for all communication activities during the design and construction of the Project, as well as during the Work pre-operational and Operating Periods.
- C. The plan shall provide a detailed outline of communication tools and strategies to be employed during each phase of the Project development, delivery, and operation, including the matters outlined in the sections below.
- D. The plan shall contain a crisis communications plan and procedures for coordination with the Department and responsiveness to the media.

2.4.2 Stakeholder Outreach and Information

- A. The Concessionaire shall develop, deliver, and operate the Project in a manner consistent with building and maintaining effective working relationships with all stakeholders in the Project's success.
- B. The Concessionaire shall:
1. develop and maintain a comprehensive stakeholder database to track and manage stakeholder communication that will be shared with the Department's Customer Relations Management (CRM) system;
 2. develop and maintain the Project website;
 3. ensure that the website shall at a minimum contain a graphical Project overview, contact information, plan of work for the coming month, overall Project schedule, a frequently asked

questions area, and updated Project photos. The website shall be updated as necessary throughout the duration of the Project;

4. provide a point of contact and phone number for the public to ask questions and share concerns during the Project;
5. develop, in collaboration with the Department, a proactive program of stakeholder engagements to brief local stakeholders on the Project's progress, features and benefits;
6. where possible, afford stakeholders the opportunity to provide input to project planning and development;
7. develop tailored marketing and communications material for relevant stakeholder groups;
8. establish ongoing mechanisms for stakeholder information and input during the Project's operational phase, including communications surrounding enforcement technologies and strategies; and
9. establish partnerships with local groups and organizations where there is mutual benefit in supporting the Project.

3 Design and Construction Requirements

3.1 General

- A. The Project shall be designed and constructed pursuant to the design criteria and specifications set forth in the Agreement (including the Technical Requirements).
- B. The Work shall not preclude the local, state, and federal long-range transportation planning improvements.
- C. All Design Documentation and Construction Documentation shall comply with the requirements of applicable Governmental Authorities.
- D. All Work shall comply with Good Industry Practice.
- E. Where the Work to be performed does not meet minimum American Association of State Highway and Transportation Officials (AASHTO) standards and specifications, the Concessionaire shall submit a design exception, pursuant to the Department's Instructional and Informational Memorandum on design exceptions, (using LD-440 format) for Department and FHWA approval.
- F. Where the Work to be performed meets or exceeds minimum AASHTO design criteria, but does not meet the Department's minimum standards and specifications, the Concessionaire shall submit a design waiver (using LD-448 format) for Department approval.
- G. The Concessionaire shall be solely responsible for acquiring design exceptions and design waivers. The Department's approval of a Concessionaire request for a design exception does not guarantee FHWA approval. 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, if such additional information or changed conditions materially affect the premise on which the original design exception or design waiver at issue was based.
- H. The Concessionaire shall take all reasonable efforts to 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 adversely affected by the performance of the Work. Prior to commencing Work the Concessionaire shall perform property pre-

condition surveys and monitor their condition during the Work period. The Concessionaire shall repair any damage caused by the Work to at least a condition comparable to that which existed immediately prior to the damage. The Department shall be given the opportunity to witness any pre-condition surveys and/or monitoring and the Concessionaire shall make the results available to the Department before commencing any Work that may affect the property.

- I. Values for properties of materials to be used in the Work shall conform to the specified values or range of values in the Standard Documents and specified in the Technical Requirements. Less than complete conformity may be tolerated if obtaining exact or complete conformity would not be feasible and if authorized by the Department. If permissible tolerances are exceeded or if consistent deviations from the plans or abrupt changes in grade occur, even though within the tolerances, the Concessionaire shall ensure that the affected areas are reconstructed to conform to the specified tolerance such that the Work is fit for its intended purpose.
- J. The Project is considered part of the Strategic Highway Network (STRAHNET).
- K. All Design Documentation and Construction Documentation shall be in English units.
- L. The Concessionaire 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. Within 30 days after Final Acceptance, or other such timeframe as may be agreed to by both parties, the Concessionaire shall remove its construction equipment, materials and debris from the Project Right of Way and other property adjacent to the Project.
- M. When removal of mailboxes and newspaper boxes is made necessary by construction operations, the Concessionaire shall place them in temporary locations so that access to the boxes will not be impaired. Prior to Final Acceptance, boxes shall be placed in their permanent locations as agreed with the Department, upgraded to current criteria, and left in as good condition as when found.
- N. The Concessionaire shall take all reasonable efforts to 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 Concessionaire shall use suitable precautions to prevent damage to such property. If property is damaged, the Concessionaire shall restore

property to a condition similar or equal to that existing before such damage was done by repairing, rebuilding, or restoring, or making settlement with the property owner. Where property of third parties has been damaged and repaired by the Concessionaire, the Concessionaire shall secure from the owner a release from any claim against the Department. A copy of this release shall be furnished to the Department.

- O. The Concessionaire shall provide certified letters to the property owners at the address on record that comply with the Code of Virginia § 33.1-94, Right of Entry. Copies of the letters, signed return receipt or proof of delivery shall be provided to the Department fifteen days after the proof of delivery. Notice of intent to enter shall be deemed made on the earlier of the date of mailing, if mailed, or on the date delivered.

3.2 Inspection of Work

3.2.1 Inspection of Work

- A. The Concessionaire is responsible for continuous quality control and quality assurance in accordance with the QMSP. All stages, materials, and details of the Work are subject to independent inspection by the Department in accordance with the Agreement. The Department shall be allowed access to all parts of the Work in accordance with the Agreement, subject to meeting the requirements under the Health, Safety and Security Plan, and shall be furnished such information and assistance by the Concessionaire in accordance with the Agreement. The Department shall have ready access to machines and plant equipment used in processing or placing materials.
- B. The Concessionaire shall keep the Department informed of planned operations in accordance with the requirements of the Agreement.
- C. If materials are used or work is performed without following the relevant QMSP, the Department may require the Concessionaire to remove and replace nonconforming work or material. The Concessionaire shall abide by the relevant QMSP in terms of correcting defective, deficient, or non-conforming work. Any such defective, deficient, or non-conforming work that is not completely replaced or otherwise remains in place, must be accepted by the Department prior to the addition of any new work being constructed on or adjacent to the defective, deficient, or non-conforming work, unless otherwise mutually agreed by all parties. Approval or disapproval of non-conforming work shall be given by the Department within fourteen (14) days of submittal to the Department, or as otherwise mutually agreed. Any basis for disapproval must be

submitted to the Concessionaire in writing by the Department. As mutually agreed, the Concessionaire may provide the Department with a credit to the contract value for the Department's acceptance of such work that is performed on a Department Shared Asset or Department-maintained facility.

- D. If an inspection reveals that Work has not been properly performed, the Concessionaire shall promptly inform the Department of its schedule for correcting such Work and the time when an inspection of the corrected Work can be made in accordance with the relevant QMSP.

3.2.2 Removal of Unacceptable or Unauthorized Work

- A. The QMSP must ensure that Work that does not conform to the requirements of the Agreement, including Good Industry Practice, is promptly identified by the responsible party, as identified in the QMSP. Such Work shall be designated as unacceptable and shall be remedied or removed and replaced within 30 days or as agreed to by the Department and will not be covered or incorporated into the Project, unless as otherwise agreed by the Department.
- B. No Work shall be done until the Concessionaire establishes the applicable right-of-way, lines and grades. Work that is done beyond the lines shown on the plans, unless otherwise agreed, will be considered unauthorized. Such work shall be subject to review by the Department and may be ordered removed or replaced.
- C. If the Concessionaire fails to comply promptly with any order of the Department or the Quality Assurance Manager made under the provisions of the Quality Management System Plan or the Department's *Minimum Requirements for Quality Assurance & Quality Control on Design-Build & Public-Private Transportation Act Projects – August 2007 (revised July 2008)*, the Department or the Quality Assurance Manager will have the authority to cause unacceptable Work to be remedied or removed and replaced and unauthorized Work to be removed. If the Concessionaire has failed to exercise the appropriate oversight of the project with regards to the remedy of defective, deficient, or non-conforming Work, or the prevention of such defective, deficient, or non-conforming Work from re-occurring, the Department shall have the right to stop or suspend the affected Work until such time the defective, deficient, or non-conforming Work is remedied.

3.3 Environmental

3.3.1 Environmental Documentation

- A. The Concessionaire will comply with the environmental commitments set forth in the approved NEPA Document(s) as defined in the Agreement, as well as the Environmental Certification, and Plans, Specifications, and Estimates re-evaluation forms completed for the Project.
- B. The Concessionaire will ensure that the environmental commitments and all conditions of regulatory approvals made in the approved NEPA Document(s), including the documentation referenced in Table 3.2 are implemented at the appropriate phase of Project development. The Concessionaire will provide documentation to the Department as each environmental commitment and/or condition of a Regulatory Approval is implemented.

Table 3.2 NEPA Documentation	
Document	Date
Environmental Assessment	September 8, 2011
Finding of No Significant Impact (FONSI)	December 5, 2011
Right of Way Re-evaluation review (Northern phase)	To be completed
Environmental Certification review (Northern phase)	To be completed
Plans, Specification and Estimate (PS&E) Re-evaluation review (Northern phase)	To be completed

- C. If the Concessionaire becomes aware of new information that may have a bearing on environmental impacts or the Concessionaire proposes changes to the Project design and/or footprint, it shall initiate consultation promptly with the Department to determine the need for a re-evaluation of the NEPA approvals. The Department shall be responsible for preparation of any re-evaluation of the NEPA approvals. The Concessionaire shall assist the Department with applicable technical studies upon request in support of the NEPA re-evaluation.
- D. Prior to right of way authorization for total and partial takes, the Concessionaire shall provide the Department with a completed PM-130 form and right of way plans (approved as per the Agreement). The Concessionaire will perform the right of way re-evaluation review to determine the Right of Way to be acquired is in compliance with the NEPA approvals. For right-of-way acquisitions other than Project Right of Way, if the Department or FHWA determine that the plans are not consistent with the NEPA approvals, the Concessionaire shall revise the plans until they are consistent; or the Department shall

prepare a re-evaluation of the NEPA documentation for FHWA approval. The Department shall provide copies of all right of way re-evaluation reviews to the FHWA.

- E. Prior to approval of the AFC Documents, the Concessionaire shall provide the Department with a completed PM-130 form and plans. The Department will perform the Environmental Certification review and Plans, Specifications, and Estimates (PS&E) re-evaluation review and determine if plans are consistent with the scope of the NEPA approvals and all environmental commitments. If the Department or FHWA determines that the plans are not consistent with the NEPA approvals, the Concessionaire shall revise the plans until they are consistent; or the Department shall prepare a re-evaluation of the NEPA approvals for FHWA approval. The Department shall provide copies of all Environmental Certification reviews and PS&E re-evaluation reviews to the FHWA.
- F. The Concessionaire is responsible for compliance with Law for potential staging and disposal areas outside the Project limits. The Concessionaire is also responsible for obtaining a property owner agreement for potential areas outside the existing State right-of-way. Any such potential locations within the existing State right-of-way will require the Concessionaire to obtain a Land Use Permit from the Department.

3.3.2 Water Quality Permits

- A. The Concessionaire is responsible for any determinations, delineations, coordination, applications, mitigation, avoidance measures, acquisitions for impacts to streams and wetlands, and administration of required state and federal water quality permits and permit modifications required for construction of the Project. The Concessionaire shall be responsible for compliance with pre-construction, construction-related, and post-construction permit conditions. Compensation, per the Agreement, for impacts to streams and wetlands mitigated by the purchase of wetland and stream credits are the responsibility of the Department. Compensation, per the Agreement, for impacts to streams and wetlands mitigated by stream restoration construction are the responsibility of the Concessionaire. Any fines or delays associated with water quality permit violations arising out of the performance of the Concessionaire's obligations under the Agreement are the responsibility of the Concessionaire.
- B. The Concessionaire or its nominee will be listed as the “permittee” in all cases. These permits, and any permit modifications, will be obtained by the Concessionaire, copies provided to the Department, and verified prior to the issuance of a Limited Notice to Proceed.

- C. If in the course of performing its obligations under the Agreement the Concessionaire dumps, discharges, or spills any oil or chemical that reaches or has the potential to reach a waterway in violation of Law, it shall immediately notify all appropriate jurisdictional state and federal agencies and shall take immediate actions to contain, remove, and properly dispose of the oil or chemical in accordance with local, state and federal requirements.
- D. Constructing new bridge(s) and dismantling and removing existing bridge(s) shall be accomplished in a manner that will prevent the dumping or discharge of construction or disposable materials into rivers, streams, or impoundments in violation of Law. Construction operations in rivers, streams, or impoundments shall be restricted to those areas where channel changes are permitted and must be entered for the construction of structures. Rivers, streams, and impoundments shall be cleared of falsework, piling, debris, or other obstructions placed therein or caused by construction operations.
- E. Excavation material shall be disposed of in approved areas above the mean high water mark shown on the plans in a manner that will prevent the return of solid or suspended materials to state waters. If the mark is not shown on the plans, the mean high water mark shall be considered the elevation of the top of stream banks.
- F. The Concessionaire shall conduct all operations near rivers, streams, or impoundments in accordance with applicable water quality permits and shall not conduct clearing or grubbing within 100 feet of the limits of ordinary high water or a delineated wetland unless specifically authorized in the permits.

3.3.3 Water Pollution

- A. The Concessionaire shall exercise every reasonable precaution throughout the Term to prevent pollution of rivers, streams, and impoundments. Pollutants such as chemicals, fuels, lubricants, bitumens, raw sewage, paints, sedimentation, and other harmful material shall not be discharged into or alongside rivers, streams, or impoundments or into channels leading to them.
- B. The Environmental Management Plan shall include a contingency plan for reporting and immediate actions to be taken in the event of a dump, discharge, or spill. Construction discharge water shall be filtered to remove deleterious materials prior to discharge into state waters. During specified spawning seasons, discharges and construction activities in spawning areas of state waters shall be restricted so as not to disturb or inhibit aquatic species that are indigenous to the waters. Neither water nor other effluence shall be discharged onto wetlands or

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breeding or nesting areas of migratory waterfowl. When used extensively in wetlands, heavy equipment shall be placed on mats.

- C. Temporary construction fills and mats in wetlands and flood plains shall be constructed of approved non-erodible materials and shall be removed by the Concessionaire to natural ground upon completion of the Work in the wetlands or flood plains, unless specifically approved by the Department (in writing) to be left in place.
- D. If the Concessionaire dumps, discharges, or spills any oil or chemical that reaches or has the potential to reach a waterway, it shall immediately notify all appropriate jurisdictional state and federal agencies and shall take immediate actions to contain, remove, and properly dispose of the oil or chemical in accordance with the local, State and federal requirements.
- E. Excavation material shall be disposed of in approved areas above the mean high water mark shown on the plans in a manner that will prevent the return of solid or suspended materials to state waters. If the mark is not shown on the plans, the mean high water mark shall be considered the elevation of the top of stream banks.
- F. Constructing new bridge(s) and dismantling and removing existing bridge(s) shall be accomplished in a manner that will prevent the dumping or discharge of construction or disposable materials into rivers, streams, or impoundments in violation of Law. Construction operations in rivers, streams, or impoundments shall be restricted to those areas where channel changes are permitted and must be entered for the construction of structures. Rivers, streams, and impoundments shall be cleared of falsework, piling, debris, or other obstructions placed therein or caused by the performance of the Work.
- G. Stabilization of the streambed and banks shall occur immediately upon completion of work if work is suspended for more than 15 days. The Concessionaire shall prevent stream constriction that would reduce stream flows below the minimum, as defined by the State Water Control Board, during construction operations.
- H. If it is necessary to relocate an existing stream or drainage facility temporarily to facilitate construction, the Concessionaire shall design and provide temporary channels or culverts of adequate size to carry the normal flow of the stream or drainage facility. Stabilization of the streambed and banks shall occur immediately upon completion of, or during the work if the work is suspended for more than 15 days.
- I. The Concessionaire shall submit a temporary relocation design to the Department for review and acceptance in sufficient time to allow for

discussion and correction prior to beginning the work the design covers. The Concessionaire shall pay costs for the temporary relocation of the stream or drainage facility shall be included in appropriate items of the Agreement. Temporary bridges or other structures shall be used wherever an appreciable number of stream crossings will be made.

- J. The Concessionaire shall conduct all operations near rivers, streams, or impoundments in accordance with applicable water quality permits and shall not conduct clearing or grubbing within 100 feet of the limits of ordinary high water or a delineated wetland unless specifically authorized in the permits.

3.3.4 Hazardous Substances

This section shall be read in conjunction with the Agreement, and both shall set forth the Concessionaire's responsibilities for the management of Hazardous Substances.

- A. In accordance with the Agreement, the Concessionaire shall perform any additional studies and investigations as necessary to constitute an appropriate level of due diligence and/or determine actions to ensure due care with respect to Hazardous Substances. The Concessionaire shall submit a summary of findings to the Department.
- B. The Concessionaire's Environmental Management Plan shall include a construction hazardous materials management plan, which shall include: (a) copies of any environmental site assessments undertaken; (b) detailed recommendations for further study or site evaluation, where such studies or evaluations are considered necessary to determine impacts to the Project from identified or suspected contamination; (c) plans for management of any Hazardous Substances used or generated by the Concessionaire during the Work period, and (d) for any property proposed for acquisition which contains, or could reasonably be expected to contain, a Hazardous Environmental Condition attributable to Known Pre-Existing Hazardous Substances, the Concessionaire shall include, within the construction hazardous materials management plan, the appropriate plan for containment, management, mitigation, and/or remediation. The plan shall be submitted to the Department for review and comment in accordance with Attachment 1.3.
- C. Following the acquisition and vacation of properties and associated activities, the Concessionaire shall perform asbestos inspections of all structures and if necessary, shall perform asbestos abatement and asbestos monitoring in accordance with the Department's asbestos inspection procedures and asbestos abatement specifications. The

Concessionaire shall perform abatement of asbestos-containing materials and asbestos project monitoring in accordance with all Law, as well as the applicable standards referenced in Attachment 1.5a.

- D. The Environmental Management Plan shall include a Spill Prevention, Control, and Countermeasure (SPCC) plan as required by regulation, which shall have been reviewed by the Department prior to the initiation of oil storage activities.
- E. The Concessionaire shall retain copies of all property studies, documents prepared for containment, management, mitigation and/or remediation, asbestos-related records and any other construction-related Hazardous Substances records in accordance with the requirements of the Agreement. A final copy of all such records shall be submitted to the Department within 30 days after Final Acceptance.

3.3.5 Environmental Monitoring

- A. The Concessionaire is responsible for the monitoring of compliance, in accordance with environmental permit requirements, with all applicable environmental laws and regulations. Should any non-compliant item(s) be identified by the Concessionaire, continuous corrective action will be taken by the Concessionaire to bring the item(s) back into compliance. Notification of this circumstance shall be provided promptly by the Concessionaire to the Department.
- B. The Concessionaire will be responsible for, but not limited to, monitoring the Project Right of Way for nesting migratory bird species and complying with the *Migratory Bird Treaty Act* for recommended time of year restrictions.
- C. Except as set forth in the Agreement, the Concessionaire will be responsible for all costs, fines, penalties, and delays associated with any non-compliant items.
- D. The Department reserves the right to perform quality assurance environmental monitoring of the Project to determine whether the Concessionaire is complying with environmental commitments to Governmental Authorities and is performing activities in accordance with Law and Department specifications.

3.3.6 Environmental Stipulations

The Concessionaire hereby stipulates that any facility used in the performance of the Agreement is not listed on the EPA's List of Violating Facilities pursuant to 40 C.F.R. 15.20 (unless the Concessionaire confirms that the Project is exempt under the Clean Air Act as amended (42 U.S.C. 1857, et seq., as amended by P.L. 91-604), the Federal Water

Pollution Control Act as amended (33 U.S.C. 1251 et seq. as amended by P.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 C.F.R., Part 15)).

3.3.7 Erosion and Siltation

- A. The Concessionaire will develop and implement an erosion and sediment control plan, a stormwater pollution prevention plan and a post development stormwater management plan in compliance with VDOT's approved Erosion and Sediment Control and Stormwater Management Standards and Specifications. The Concessionaire shall comply with the Department's Approved Erosion and Sediment Control Standards and Specifications (including IIM 11.26).
- B. The Concessionaire shall exercise temporary and permanent measures, throughout the Term, to control erosion and prevent or minimize siltation of rivers, streams, lakes, and impoundments. Erosion and sediment control measures will be installed in accordance with applicable standards and specifications set forth in Attachment 1.5a.
- C. Erosion and sediment control measures shall be applied to erodible material exposed by any activity associated with construction, including local material sources, stockpiles, disposal areas, and haul roads. Temporary measures shall be coordinated with the Work to ensure effective and continuous erosion and siltation control. Permanent erosion control measures and drainage facilities shall be installed and operational as the Work progresses before temporary measures are removed.
- D. Erosion and siltation control devices and measures shall be maintained in a functional condition at all times. The Concessionaire shall have, within the limits of the Project during all land disturbing activities, an employee certified by the Department in Erosion and Sediment Control who shall inspect erosion and siltation control devices and measures for proper installation and deficiencies immediately after each rainfall, at least daily during prolonged rainfall, and weekly when no rainfall event occurs. The Concessionaire shall make a daily review of the location of silt fences and filter barriers to ensure that they are properly located for effectiveness. Deficiencies shall be corrected immediately. Such employee shall also be certified through the Department of Conservation and Recreation Inspection Certification Program.
- E. Failure on the part of the Concessionaire to maintain appropriate erosion and siltation control devices in a functioning condition may result in the Department notifying the Concessionaire in writing of specific deficiencies. The Concessionaire shall correct or take

appropriate actions to correct the specified deficiencies within 24-hours after receipt of such notification.

- F. Failure of the Concessionaire to maintain a Department-certified Erosion and Sediment Control employee within the Project Right of Way will result in a Project non-compliance and suspension of Work related to any land disturbing activity until such time as a certified Erosion and Sediment Control employee is present on the Project.

3.3.8 Air Pollution

- A. The Concessionaire shall comply with the provisions of the Agreement, all applicable Federal requirements, the State Air Pollution Control Law and Rules of the State Air Pollution Control Board, including notifications required therein.
- B. Burning shall be performed in accordance with all applicable state and local laws and ordinances and under the constant surveillance of watchpersons. Care shall be taken so that the burning of materials does not destroy or damage property or cause excessive air pollution. The Concessionaire shall not burn rubber tires, asphalt, used crankcase oil, or other materials that produce dense smoke. Burning shall not be initiated when atmospheric conditions are such that smoke will create a hazard to the motoring public or airport operations. Provisions shall be made for flagging vehicular traffic if visibility is obstructed or impaired by smoke. At no time shall a fire be left unattended.
- C. Asphalt mixing plants shall be designed, equipped, and operated so that the amount and quality of air pollutants emitted will conform to the Rules of the State Air Pollution Control Board. Emission standards for asbestos incorporated in the EPA's National Emission Standards for Hazardous Air Pollutants apply to the demolition or renovation of any institutional, commercial, or industrial building, structure, facility, installation, or portion thereof that contains friable asbestos.

3.3.9 Noise Mitigation

- A. Noise Barriers
 - 1. The Concessionaire will provide permanent noise mitigation in compliance with the Virginia State Noise Abatement Policy 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 Concessionaire at its sole cost and expense.

2. The final noise mitigation design will utilize the design year traffic volumes defined in the “Air Quality Analysis Final Report: Appendix D – Traffic Summary Information” and associated noise levels.
3. Upon approval of the Final Design Noise Analysis the Department shall prepare a concurrence letter outlining the results of the analysis for the Department’s Chief Engineer and FHWA. Once concurrence is achieved the Concessionaire shall prepare and mail letters “certified return receipt” to benefitted receptors. Upon completion of the citizen survey the Department shall prepare a second concurrence letter documenting the results.
4. All sound walls should be named as presented within the NADR.
5. All noise barriers recommended for construction and concurred with by the Chief Engineer and FHWA are included in the scope of the Construction Project and shall be funded by the Concessionaire at its sole cost and expense. This includes barriers with conditions, as long as those conditions have been met.
6. Prior to submitting a sound wall plan for the Department’s review, the Concessionaire 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.
7. If deviations in the horizontal or vertical alignment of a noise barrier are proposed following concurrence from the Chief Engineer or 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 recommended barrier and the proposed design. A justification of the deviation will be included with the plan set. The revised NADR chapter for the noise barrier for which modification is requested will be submitted with this additional information.
8. The Noise Abatement Section Manager’s written approval of the barrier deviation will be required before the Department can approve AFC Documentation.

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9. A key plan will be clearly labeled to show the location of the ground-mounted combo wall (sound wall on retaining wall) and bridge-mounted noise barriers.
10. Plan view will provide the alignment of the noise barrier with the roadway plan view.
11. 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.
12. Stations of the roadway and noise barrier will be included on both the plan and profile views.
13. Sound barrier walls will 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.
14. Sound barrier walls will have a setback from the back of the barrier no more than one foot, where feasible. The area between the barrier and wall will be filled to prevent debris from collecting in the area, if setback is one foot or less.
15. Sound barrier wall design will be coordinated with first responders to ensure access to fire hydrants and other emergency equipment, where feasible.
16. General notes that state the following will be included:
 - i. “Sound barrier walls will be designed and constructed in accordance with the Special Provisions for Sound Barrier included in the Agreement Requirements. If required, colored sound wall coatings shall be treated as a Department Change, with the exception of the sound barriers adjacent to the Landmark Mews and Overlook communities north of Turkeycock Run and along Stevenson Avenue.”
 - ii. “Sound Barrier walls will be designed and constructed in accordance with the roadway cross-sections in the

plans dated [insert date]/or sheets numbered [insert sheet numbers].”

- iii. “Sound Barrier walls will be designed and constructed in accordance with the soil parameters included in the Geotechnical Report dated [insert date].”
 - iv. “Access doors will be determined prior to fabrication, with review and approval of VDOT maintenance staff.”
 - v. “All sound barrier walls will have sound absorptive finish, unless otherwise noted.”
- 17. The Concessionaire is responsible for obtaining local noise ordinance variances prior to scheduling of night time operations pursuant to the Agreement.
 - 18. The Concessionaire shall begin construction of new sound barriers within 60 days of the demolition of an existing sound barrier and/or cutting of trees which were acting as a screen for adjacent properties. The Concessionaire shall complete construction of any new sound barrier intended to replace an existing sound barrier and/or trees which were acting as a screen for adjacent properties within 180 days from the start of construction of that sound barrier.
 - 19. If the Contractor is unable to begin construction of a new sound barrier within 60 days of the demolition of an existing sound barrier and/or cutting of trees which were acting as a screen for adjacent properties, the Concessionaire shall provide temporary noise mitigation to noise sensitive receptors where the existing noise barriers and/or trees were removed.

B. Construction Noise

- 1. The Concessionaire'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.
- 2. Concessionaire 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 Concessionaire shall take corrective action before proceeding with operations.

3. The Concessionaire shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to non-compliance with these requirements.
4. Concessionaire shall determine whether certain portions of the Project that produce objectionable noise should be restricted or prohibited between 10 PM and 6 AM. If other hours are established by local ordinance, the local ordinance shall govern.
5. 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 Concessionaire shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.
6. These requirements are not applicable if the noise produced by sources other than the Concessionaire's operation at the point of reception is greater than the noise from the Concessionaire's operation at the same point.

3.3.10 Forests

- A. The Concessionaire shall take all reasonable precautions to prevent and suppress forest fires in any area involved in construction operations or occupied by it or its contractors as a result of such operations.
- B. The Concessionaire shall cooperate with the proper authorities of the state and federal governments in reporting, preventing, and suppressing forest fires. Labor, tools, or equipment furnished by the Concessionaire upon the order of any forest official issued under authority granted the official by law shall not be considered a part of the Agreement.
- C. The Concessionaire shall negotiate with the proper forest official for compensation for such labor, tools, or equipment.

3.3.11 Archeological, Paleontological, and Rare Mineralogical Findings

- A. In the event that a previously unidentified historic property (prehistoric or historic district, archaeological site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places) is discovered once construction has begun, the Concessionaire shall immediately halt all construction work in the area of the resource and in surrounding areas where additional subsurface

remains can reasonably be expected to occur. Work in all other areas of the Project may continue. The Concessionaire shall immediately notify the Department, which will in turn notify the FHWA. The FHWA, in cooperation with the Department and the Concessionaire, shall then address the discovery in accordance with one of the applicable processes described at 36 CFR 800.13. The Concessionaire shall be responsible for conducting any technical studies needed to determine whether the resource is eligible for inclusion on the National Register of Historic Places and whether the Project will affect the resource, and for implementing appropriate treatment as determined through FHWA's consultation with the Virginia State Historic Preservation Officer. Subject to the exception in the Agreement, all costs associated with these technical studies and treatment actions shall be the responsibility of the Concessionaire. Pursuant to §10.1-2302 of the *Code of Virginia*, prior to conducting any archaeological investigations on state-controlled lands (including state-owned highway right of way), the Concessionaire must first obtain a permit from the Director of the Virginia Department of Historic Resources.

- B. In the event fossils, meteorites, or other articles of paleontological or rare mineralogical interest are discovered once construction has begun, the Concessionaire shall immediately suspend work at the site of the discovery and notify the Department. The Department will immediately notify the proper state authority charged with the responsibility of investigating and evaluating such finds. The Concessionaire shall cooperate and assist the Department in protecting, mapping, and removing the finds as determined necessary by the Department in consultation with the proper state authority.
- C. Any archaeological remains, fossils, meteorites, or other articles of paleontological or rare mineralogical interest found on state-controlled lands (including state-owned highway right of way) are the property of the Commonwealth of Virginia. Articles recovered from other than state-controlled lands are the property of the landowner unless other agreement is reached with the owner.
- D. When the discovery of historic properties, fossils, meteorites, or other articles of paleontological or rare mineralogical interest delay the progress or performance of the work, the Concessionaire shall notify the Department immediately.

3.3.12 Storm Water Pollution Prevention Plan and Virginia Stormwater Management Program General Permit for the Discharge of Stormwater from Construction Activities

- A. The Concessionaire shall develop and provide for the Department's review and approval a Stormwater Pollution Prevention Plan

(SWPPP”. A SWPPP identifies potential sources of pollutants which may reasonably be expected to affect the stormwater discharges from the construction site and any off site support areas and describes and ensures implementation practices which will be used to reduce pollutants in such discharges. The SWPPP is comprised of, but not limited to, the Erosion and Sediment Control (ESC) Plan, the Stormwater Management (SWM) Plan, and related specifications and standards contained within the Agreement and shall be required for all land-disturbing activities that disturb 10,000 square feet or greater, or 2,500 square feet or greater in Tidewater, Virginia. Land-disturbing activities that disturb 1 acre or greater, or 2,500 square feet or greater in an area designated as a Chesapeake Bay Preservation Area, require coverage under the Department of Conservation and Recreation’s Virginia Stormwater Management Program (VSMP) General Permit for the Discharge of Stormwater from Construction Activities (“VSMP Construction Permit”). Where applicable, the Concessionaire will apply for and retain coverage under the VSMP Construction Permit for those land disturbing activities for which it has control. The required contents of a SWPPP for those land disturbance activities requiring coverage under the VSMP Construction Permit are found in Section II D of the General Permit section of the VSMP Regulations (4VAC50-60-1170). While a SWPPP is an important component of the VSMP Construction Permit, it is only one of the many requirements that must be addressed in order to be in full compliance with the conditions of the permit. The SWPPP needs to be reviewed and approved by VDOT prior to applying for coverage under the VSMP General Construction Permit. The Concessionaire shall prepare a SWPPP that includes ESC Plan and a post-construction SWM Plan for the entire Project. Such plans shall be prepared in accordance with the standards and specifications set forth in Attachment 1.5a and submitted to the Department for its approval before the commencement of any land disturbing activities. The SWPPP including ESC Plan and SWM Plan shall be kept current as design work progresses. Updated versions of the SWPPP including ESC Plan, and SWM Plan must be submitted to the Department for its review and approval before the Department will approve AFC Documents. The Concessionaire shall be responsible for reading, understanding, and complying with all the terms, conditions and requirements of the permit and the SWPPP, including the following:

1. **Project Implementation Responsibilities.** The Concessionaire shall be responsible for the installation, maintenance, inspection, and, on a daily basis, ensuring the functionality of all erosion and sediment control measures and all other stormwater and pollutant runoff control measures identified within or referenced within the SWPPP, plans, specifications, permits, and elsewhere in the Agreement,

including these Technical Requirements. The Concessionaire shall take all reasonable steps to prevent or minimize any stormwater or non-stormwater discharge that will have a reasonable likelihood of adversely affecting human health or public and/or private properties.

2. **Certification Requirements.** In addition to satisfying the personnel certification requirements contained herein, the Concessionaire shall certify its activities by completing, signing, and submitting Form C-45 VDOT SWPPP Contractor and Subcontractor Certification Statement to the Department at least seven days prior to commencing any Project related land-disturbing activities, both on-site and off-site.
3. **SWPPP Requirements for Support Facilities.** The Concessionaire shall develop erosion and sediment control plan(s) and storm water pollution prevention plan(s) for submission and acceptance by the Department prior to usage of any on-site or off-site support facilities, including borrow and disposal areas, construction and waste material storage areas, equipment and vehicle storage and fueling areas, storage areas for fertilizers or chemicals, sanitary waste facilities, and any other areas that may generate a stormwater or non-storm water discharge related to performance of the Work. Such plans shall document the location and description of potential pollutant sources from these areas and shall include a description of the controls to reduce, prevent and control pollutants from these sources including spill prevention and response. The Concessionaire shall submit such plans and documentation as specified herein to the Department and, upon review and approval, they shall immediately become a component of the SWPPP and VSMP Construction Permit (where applicable) and shall be subject to all conditions and requirements of the VSMP Construction Permit (where applicable) and the Agreement, including these Technical Requirements.
4. **Reporting Procedures**
 - i. **Inspection Requirements.** The Concessionaire shall be responsible for conducting inspections in accordance with the requirements herein. The Concessionaire shall document such inspections by completion of Form C-107, Construction Runoff Control Inspection Form and Continuation Sheet, in strict accordance with the directions contained within the form.

- ii. **Unauthorized Discharge Requirements.** The Concessionaire shall not discharge into state waters sewage, industrial wastes, other wastes or any noxious or deleterious substances nor shall otherwise alter the physical, chemical, or biological properties of such waters that render such waters detrimental for or to domestic use, industrial consumption, recreational or other public uses.
- iii. **Notification of non-compliant discharges.** The Concessionaire shall immediately notify the Department upon the discovery of, or potential of, any unauthorized, unusual, extraordinary, or non-compliant discharge from the land disturbing activity. Where immediate notification is not possible, such notification shall be not later than 24 hours after said discovery.
- iv. **Detailed report requirements for non-compliant discharges.** The Concessionaire shall submit to the Department within five days of the discovery of any actual or potential non-compliant discharge, a written report describing details of the discharge to include its volume, location, cause, and any apparent or potential effects on private and/or public properties and state waters or endangerment to public health, as well as steps being taken to eliminate the discharge. A completed Form C-107 shall be included in such reports.

5. **Changes, Deficiencies and Revisions**

- i. **Changes and Deficiencies.** The Concessionaire shall report to the Department when any planned physical alterations or additions are made to the land disturbing activity or deficiencies in the Project plans or the Agreement, including these Technical Requirements are discovered that could significantly change the nature or increase the quantity of the pollutants discharged from the land disturbing activity to surface waters.
- ii. **Revisions to the SWPPP.** Where site conditions or construction sequencing or scheduling necessitates revisions or modifications to the erosion and sediment control plan or any other component of the SWPPP for the land disturbing activity, such revisions or modifications shall be approved by the Department and shall be documented by the Concessionaire on a

designated plan set. Such plans shall be kept on the Project site at all times and shall be available for review upon request.

- iii. The Concessionaire shall prepare a post-construction Storm Water Management Plan (SWMP) for the entire Project. Plans shall be prepared in accordance with the Standard Documents and submitted to the Department for its review and acceptance before any land disturbing activity.

3.4 Geotechnical

3.4.1 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 a minimum fifteen (15) years of geotechnical engineering experience and expertise working in the region and/or in areas of similar geologic settings with similar project features for this Project. The geotechnical design engineer shall be a licensed professional engineer in the state.
- 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 height) shall be in accordance with the standards and specifications set forth in Attachment 1.5a.
- C. The Concessionaire shall collect appropriate data for geotechnical evaluation of embankments, soil and rock cuts, culverts, bridge and wall structures, sound walls, storm water management facilities, minor structures including drainage pipes, and any other earth-supported structures or elements of highway design and construction. The Concessionaire shall be responsible for obtaining any Regulatory Approvals required for any borings needed in performance of the Concessionaire's geotechnical investigation for this Project. The Concessionaire 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 Concessionaire shall have a geotechnical report approved by the Department before beginning construction. The Department will not be responsible for any costs incurred that were based on geotechnical assumptions.

- D. The Concessionaire 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 *Manual of Instructions* for Materials Division and the investigation in accordance with an approved exploratory boring plan(s) approved by the Department. Preliminary and final/design geotechnical investigations shall be performed to meet the minimum requirements set forth in Attachment 1.5a. The final geotechnical investigation plan(s) shall be in compliance with Chapter 3 of the Department's *Materials Manual of Instructions*, unless otherwise approved by the Northern Virginia District Materials Engineer. The Concessionaire 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 beginning of construction. Upon request, the Department will provide its gINT© and Microsoft Access file structures for the Geotechnical Database Management System.
- E. When deviating from the standards and specifications outlined in Attachment 1.5a, the Concessionaire 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%. 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 stated in AASHTO LRFD. The Concessionaire 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 accept or reject such proposed methods.

- F. The Concessionaire shall provide to the Department geotechnical design and construction memoranda that summarize pertinent subsurface investigations, test, and engineering evaluations. Technical specifications for construction methods that are not adequately addressed in the standards and specifications set forth in Attachment 1.5a shall be provided by the Concessionaire. The Concessionaire 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 Attachment 1.5a.
- G. The Concessionaire 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/or 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 Concessionaire. The Concessionaire shall notify the quality assurance manager or

the operation and maintenance manager and the Department for any non-conformance items.

- I. The Concessionaire shall consider settlement and design foundations (bridges, retaining walls, pipes and other structures) based upon Attachment 3.4. In summary, Attachment 3.4 outlines two options for managing settlement of structures: (i) limit total settlement to ½” and subsequently limit the need for a refined analysis of the superstructure and substructure; or (ii) allow the Concessionaire 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 the 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 3.4.
- J. The Department will reimburse the Concessionaire for additional foundation work over the established baseline quantity required for increased concrete required for overhead signs, LUMS gantry and toll gantry foundations in accordance with the following terms:
 1. The baseline quantity established for the Concessionaire is as follow:
 - i. Overhead sign structures: 2,392 cy
 - ii. LUMS Gantry foundations 76 cy
 - iii. Toll Gantry foundations 558 cy
 2. Pricing for additional concrete over the baseline quantity will be based on the following established unit rates:
 - i. Overhead sign foundations: \$ 1,111.68 / cy plus 18% markup
 - ii. LUMS Gantry foundations \$ 1,123.07 / cy plus 18% markup
 - iii. Toll Gantry foundations \$ 1,094,81 / cy plus 18% markup
 3. The AFC plans and shop drawings will establish the quantities for payment for concrete for overhead signs, LUMS gantry and toll gantry drilled shaft foundation installations.

4. Payment will be made monthly, when submitted by Concessionaire, against the combined allowance budget of \$15,000,000 that includes this item, service panel feeds, and undercut, until the budget amount is reached. Any amounts exceeding the budgeted Department allowance for the combined total of these items will be borne by the Concessionaire.

3.4.2 Slope Design

Cut and fill slopes shall be no steeper than 2H:1V, unless supported by an engineering analysis based on site-specific field investigation and site-specific laboratory strength testing. Slopes steeper than 2H:1V must be approved by the Department. 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, and/or where slopes are supporting, or are supported by, retaining structures. The factors of safety listed in Table 3.4 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’s Materials Engineer. Approval of site-specific investigation plans with reduced boring frequency may require higher factors of safety. Table 3.4 is not applicable for rock cut slopes.

Table 3.4 Minimum Factors of Safety for Soil Cut/Fill Slopes		
Soil Slope analysis parameters based on:	Factor of Safety	
	Involves Structure or Critical Slope ¹	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
<ol style="list-style-type: none"> 1. A critical slope is defined as any slope that is greater than 25 ft. 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 should be analyzed for short- and long-term stability using residual strength parameters obtained from laboratory shear testing. These parameters should 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. Maclver).

6. Construction plans shall specify use of soil types consistent with the parameters used in slope analyses

Potomac Formation clay/silts are known to be present within the limits of the proposed construction. Global and slope stability analyses of Potomac Formation clay/silts shall be analyzed using residual strength parameters for problem soils wherever they are encountered and/or mapped on local geologic/soils maps.

3.5 Materials

3.5.1 Rights for and Use of Materials Found on Project

- A. With approval of the Department, the Concessionaire may use in the Project any materials found in the excavation that comply with the standards and specifications set forth in Attachment 1.5a and otherwise comply with Good Industry Practice. The Concessionaire shall replace at its own expense with other acceptable material the excavation material removed and used that is needed for use in embankments, backfills, approaches, or otherwise, unless used on the Project. The Concessionaire 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 Concessionaire shall not waste, bury, deposit, or abandon any material within the project limits. The Department may consider certain exceptions to this requirement on a “case-by-case basis”.
- B. The Department will reimburse the Concessionaire for undercut over 7,000 cubic yards and select material Type 1 fill over 62,378 tons associated with the undercut due to poor soils encountered in accordance with the following terms:
 1. The AFC drawings will establish the quantities for excavation and required fills.
 2. If during initial excavation unanticipated poor soils are encountered that require excavation over the quantities established in the AFC drawings, the Department is to be promptly notified by Concessionaire. Failure to notify the Department prior to backfill will void any adjustment to the contract price over the quantity established in the AFC drawings.
 3. Quality control staff will determine, verify and keep a daily log of any excavation being claimed by Concessionaire. The log is to include the specific location, identification of the

unanticipated soil encountered, quantity of over excavation required, and quantity and type of suitable backfill material necessary to bring sub base to AFC drawing condition.

4. Pricing for over excavation and backfill will be based on the established unit rates of \$29.90 per cubic yard plus 18% markup for excavation and \$24.16 plus 18% markup per ton for Type I select material.
5. Payment will be made monthly, when submitted by Concessionaire, against the combined allowance budget of \$15,000,000 that includes this item, service panel feeds, and concrete sign foundations, until the budget amount is reached. Any amounts exceeding the budgeted Department allowance for the combined total of these items will be borne by the Concessionaire.

3.5.2 Adjustment for Fuel

- A. The Department will allow adjustments to the monthly progress payments up or down as appropriate for cost changes in fuel used on specific items of work identified in this provision.
- B. Included in Attachment 3.5a of these Technical Requirements is a listing of standard bid items (“Fuel Adjustment Items”) the Department has identified as eligible items for fuel adjustment on this Project as well as the respective fuel factors per pay unit for those items. Only items on this listing will be eligible for adjustment. The fuel usage factor for each item is considered inclusive of all fuel usage. Non-standard pay items are not eligible for fuel adjustment.
- C. The listing of all eligible items applicable to this Project is included as Attachment 3.5a.
- D. The monthly index price to be used in the administration of this provision will be calculated by the Department from the diesel fuel prices published by the U. S. Department of Energy, Energy Information Administration on highway diesel prices, for the Lower Atlantic region. The monthly index price will be the price for diesel fuel calculated by averaging each of the weekly posted prices for that particular month.
- E. For the purposes of this provision, \$3.82 per gallon will be used as the base index price.
- F. The current monthly index price will be posted by the Department and will be calculated using the data from the month preceding the particular progress payments being vouchered for payment.

- G. The current monthly quantity for eligible items of work for fuel adjustment will be multiplied by the appropriate fuel factor to determine the gallons of fuel to be cost adjusted. The amount of adjustment per gallon will be the net difference between the current index price and the base index price. Computation for adjustment will be made as follows:

$$S = (E - B) Q * F$$

Where:

S = Monetary amount of the adjustment (plus or minus)

B = Base index price

E = Current index price

Q = Quantity of individual units of work

F = Appropriate fuel factor

- H. Adjustments will not be made for work performed beyond the original contract time limit unless the original time limit has been changed by an executed Change Order.
- I. If new pay items are added to this contract by Change Order and they are listed in Attachment 3.5a, the Change Order must indicate which of these individual items will be fuel adjusted; otherwise, those items will not be fuel adjusted. If applicable, designating which new pay items will be added for fuel adjustment must be determined during development of the Change Order and clearly shown on the Form C-10 Change Order. The base index price on any new eligible pay items added by Change Order will be the base index price posted for the month in which bids were received for that particular Change Order. The current index price for any new eligible pay items added by Change Order will be the index price posted for the month preceding the monthly payment on which the Change Order is paid.
- J. When quantities differ between the last monthly progress payment prepared upon final acceptance and the final payment, adjustment will be made using the appropriate current index for the period in which that specific item of work was last performed.
- K. In the event any of the base fuel prices in this contract increase more than 100 percent (i.e. fuel prices double), the Department will review each affected item of work and give the Concessionaire written notice if work is to stop on any affected item of work. The Department

reserves the right to reduce, eliminate or renegotiate the unit price for remaining portions of affected items of work.

- L. Any amounts resulting from fuel adjustment will not be included in the total cost of work for determination of progress or for extension of contract time.
- M. Concessionaire shall be responsible to document and submit the adjustment for fuel to the Department for approval at the time of submitting the monthly progress payments.

3.5.3 Polymer Modified (PG 76-22 and PG 70-28) Asphalt Cement Adjustment

- A. For asphalt concrete mixtures requiring the use of Performance Graded asphalt cement PG 76-22 or PG 70-28, the Concessionaire has used \$704.50 (f.o.b.) per ton for asphalt cement PG 76-22 or PG 70-28 to develop the design-build price.
- B. During the life of the Contract, the Concessionaire shall document to the Department, by invoice signed by the supplier, the cost for PG 76-22 or PG 70-28 used. The Concessionaire will then adjust payments for asphalt concrete containing PG 76-22 or PG 70-28 by the difference in the actual f.o.b. price and \$704.50 per ton quote used during the development of design-build price. Concessionaire shall be responsible to document and submit the Polymer Modified (PG 76-22 and PG 70-28) Asphalt Cement Adjustment to the Department for approval at the time of submitting the monthly progress payments.

3.5.4 Price Adjustment for Asphalt Material

- A. All asphalt material contained in the attached master listing of standard eligible bid items and designated by pay items on this Project, are eligible for price adjusted in accordance with the provisions as set forth herein. Other items will not be adjusted. If new pay items which contain asphalt material are established by Change Order, they will not be subject to Price Adjustment for Asphalt Material unless specifically designated in the Change Order to be subject to Price Adjustment for Asphalt Material.
- B. Each month, the Department will publish an average statewide PG 64-22 f.o.b. price per ton developed from the average terminal prices provided to the Department from suppliers of asphalt cement to the contractors doing work in Virginia. The Department will collect terminal prices from approximately 12 terminals each month. These prices will be received once each month from suppliers on or about the last weekday of the month. The high and low prices will be eliminated and the remaining values averaged to establish the average statewide price for the following month. That monthly statewide average price

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will be posted on the Departmental Scheduling and Contract Division website on or about the first weekday of the following month.

- C. The listing of all eligible items applicable to this Project is included as Attachment 3.5b.
- D. This monthly statewide average price will be the base index for all contracts on which bids are received during the calendar month of its posting and will be the current index for all asphalt placed during the calendar month of its posting. In the event an index changes radically from the apparent trend, as determined by the Department, the Department may establish an index which it determines to best reflect the trend.
- E. For the purposes of this provision, \$594.50 per ton will be used as the base index.
- F. The amount of adjustment applied will be based on the difference between the contract base index and the current index for the applicable calendar month during which the work is performed. Adjustment of any asphalt material item designated as a price adjustment item which does not contain PG 64-22, except PG 76-22, will be based on the indexes for PG 64-22. The quantity of asphalt cement for asphalt concrete pavement to which adjustment will be applied will be the quantity based on the percent of asphalt cement shown on the appropriate approved job mix formula.
- G. The quantity of asphalt emulsion for surface treatments to which adjustment will be applied will be the quantity based on 65 percent residual asphalt.
- H. Price adjustment will be shown as a separate entry on the monthly progress estimate; however, such adjustment will not be included in the total cost of the work for progress determination or for extension of contract time.
- I. Any apparent attempt to unbalance bids in favor of items subject to price adjustment or failure to submit required cost and price data as noted hereinbefore may result in rejection of the bid proposal.
- J. Adjustments will not be made for work performed beyond the original contract time limit unless the original time limit has been changed by an executed Change Order.
- K. Concessionaire shall be responsible to document and submit the Price Adjustment for Asphalt Material to the Department for approval at the time of submitting the monthly progress payments.

3.5.5 Samples, Tests, and Cited Specifications

The responsibility for quality control, quality assurance, and ensuring compliance with applicable specifications and testing requirements lies with the Concessionaire. The Concessionaire'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.

3.5.6 Material Delivery

The Concessionaire shall advise the Department at least two weeks prior to the delivery of any material from a commercial source. Upon delivery of any such material to the project, the Concessionaire shall confirm that the material meets the requirements of the Technical Requirements and, if so, shall provide the Department with one copy of all invoices (prices are not required).

3.5.7 Plant Inspections

If the Department inspects materials at the source, the following conditions shall be met:

- A. The Department shall have the cooperation and assistance of the Concessionaire and producer of the materials.
- B. The Department shall have full access to parts of the plant that concern the manufacture or production of the materials being furnished.

3.5.8 Storing Materials

- A. Materials shall be stored in a manner so as to ensure the preservation of their quality and fitness for the Work. When considered necessary by the Concessionaire's quality assurance manager or the Department, materials shall be stored in weatherproof buildings on wooden platforms or other hard, clean surfaces that will keep the material off the ground. Materials shall be covered when directed by the Department. Stored material shall be located so as to facilitate its prompt inspection. Portions of the Project Right of Way approved by the Department may be used for storage of material and equipment and for plant operations. However, equipment and materials shall not be stored within the clear zone of the travel lanes open to traffic.
- B. Additional required storage space shall be provided by the Concessionaire. Private property shall not be used for storage purposes without the written permission of the owner. Copies of the written permission shall be furnished to the Department. Upon completion of the use of the property, the Concessionaire shall furnish to the Department a release signed by the property owner indicating that the property has been satisfactorily restored.

- C. Chemicals, fuels, lubricants, bitumens, paints, raw sewage, and other harmful materials as determined by the Concessionaire's quality assurance manager or the Department shall not be stored within any floodplain unless no other location is available and only then shall the materials be stored in a secondary containment structure(s) with an impervious liner. Also, any storage of these materials in proximity to natural or man-made drainage conveyances or otherwise where the materials could potentially reach a waterway if released under adverse weather conditions, must be stored in bermed or diked area or inside a container capable of preventing a release. Double-walled storage tanks shall meet the berm/dike containment requirement except for storage within flood plains. Any spills, leaks, or releases of such materials shall be addressed in accordance with the Agreement. Accumulated rain water may also be pumped out of the impoundment area into approved dewatering devices.

3.5.9 Handling Materials

Materials shall be handled in a manner that will preserve their quality and fitness for the work. Aggregates shall be transported from storage to the work in vehicles constructed to prevent loss or segregation of materials.

3.5.10 Unacceptable Materials

Materials that do not conform to the Technical Requirements shall be considered unacceptable. Such materials, whether in place or not, will be rejected and shall be removed from the site of the Work. If it is not practical for the Concessionaire to remove rejected material immediately, the Concessionaire will mark the material for identification. Rejected material whose defects have been corrected shall not be used until approval has been given by the Department in accordance with the QMSP.

3.5.11 Materials Furnished by the Department

- A. The Concessionaire shall furnish all materials required to complete the Work except those specified to be furnished by the Department.
- B. Material furnished by the Department will be delivered or made available to the Concessionaire at the points specified in the Agreement.
- C. After receipt of the materials, the Concessionaire shall be responsible for material delivered to it, including shortages, deficiencies, and damages that occur after delivery, and any demurrage charges.

3.5.12 Local Material Sources (Pits and Quarries)

- A. Local material sources, other than active commercial sand and gravel and quarry operations, opened by the Concessionaire or its

subcontractors shall be concealed from view from the completed roadway and any existing public roadway. Concealment shall be accomplished by selectively locating the pit or quarry and spoil pile, providing environmentally compatible screening between the pit or quarry site and the roadway, or using the site for another purpose after removal of the material, or restoration equivalent to the original use (such as farm land, pasture, turf, etc.).

- B. Should the Concessionaire wish to source construction materials from (non-commercial) new pits or quarries the Concessionaire shall furnish the Department a statement signed by the property owner in which the property owner agrees to the use of their property as a source of material for the project. Upon completion of the use of the property as a material source, the Concessionaire 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 Concessionaire, and sources furnished by the Department.

- C. Local material pits and quarries that are not operated under a local or State permit shall not be opened or reopened without authorization by the Department. The Concessionaire shall prepare a site plan, including the following:
 - 1. the location and approximate boundaries of the excavation;
 - 2. procedures to minimize erosion and siltation;
 - 3. provision of environmentally compatible screening;
 - 4. restoration;
 - 5. cover vegetation;
 - 6. other use of the pit or quarry after removal of material, including the spoil pile;
 - 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 three acres flows across a disturbed area. Sediment basins are required if the runoff from a watershed area of three acres or more flows across a disturbed area. The Concessionaire shall certify that the sediment trap or basin design is in compliance with Good Industry Practice and the standards and specifications set forth in Attachment 1.5a. Once a sediment trap or basin is constructed, the dam and all outfall areas shall be immediately stabilized.
- D. The Concessionaire’s design and restoration shall be in accordance with Good Industry Practice.

3.5.13 Disposal Areas

- A. Unsuitable or surplus material shall be disposed of by the Concessionaire off the Project Right of Way. The Concessionaire 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 unsuitable or surplus material.
- B. Prior to the Department approving a disposal area, the Concessionaire 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 three acres flows across a disturbed area. Sediment basins are required if the runoff from a watershed area of three acres or more flows across a disturbed area. The Concessionaire shall certify that the sediment trap or basin design is in compliance with Good Industry Practice and standards and specifications set forth in Attachment 1.5a. 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 Concessionaire's design and restoration shall conform to the requirements of the Agreement, including Good Industry Practice.
- D. The Concessionaire 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 Concessionaire 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 Concessionaire, and sources furnished by the Department.
- E. The Concessionaire will obtain VSMP Construction Permit as well as any other applicable permits for a disposal area, which shall be in compliance with the standards and specifications set forth in Attachment 1.5a.

3.6 Drainage

The criterion detailed herein is shown in the Department's *Drainage Manual* and associated Hydraulic Design Advisories and Instructional and Informational Memoranda

(IIM) and relates specifically to minimum flood protection of the roadway and bridge structures. All other hydraulic criteria not referenced herein, including but not limited to, increases in existing flood levels, bridge scour protection, protection of downstream waterways, upstream and downstream property impacts and compliance with environmental and safety requirements, shall be in accordance with the Attachment 1.5a.

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

- A. The drainage design will include but not be limited to enclosed storm sewer systems, curb inlets, stormwater management systems for water quality and water quantity, manholes, junction boxes, culverts, headwalls, channels, ditches, bridge drainage assemblies and structures that remove and transport runoff or convey stream flows, adequate outfalls, and erosion and sediment control. These efforts shall be in compliance with the Attachment 1.5a.
- B. The Concessionaire will prepare drainage design criteria and a list of software packages to be used in the design prior to commencement of work for review and approval by the Department.
- C. The Concessionaire will assemble and review all available data, studies, and development plans impacting the Project corridor for use in preparing the drainage design. The Concessionaire will perform a hydrologic analysis within the limits of the Project and extend the analysis to include all offsite areas that will drain through or impact the Project.
- D. The Concessionaire shall design and install new drainage facilities and will be permitted to use existing drainage systems that have adequate hydraulic capacities, in accordance with applicable standards and specifications set forth in Attachment 1.5a.
- E. All existing drainage facilities within the Project Right of Way that are adversely impacted by the Concessionaire's activities and that the Concessionaire intends to leave in place shall be evaluated and verified to have adequate hydraulic capacity for ultimate land use conditions; in accordance with the 2002 (Revised 4/2010) VDOT Drainage Manual at Concessionaire's cost. The Concessionaire shall verify the structural adequacy of such existing drainage facilities which the Concessionaire intends to leave in place for continued use which will be subjected to additional embankment, and/or live loading. Where any such existing drainage facilities within the Project Right of Way is deemed to be structurally or hydraulically design deficient, the additional embankment and/or live loading is equal to or less than the maximum existing embankment and/or live loading measured over any portion of the existing drainage facility, and where the Concessionaire

does not adversely impact these facilities, the Department shall determine whether to rehabilitate or replace the drainage system to ensure a continued service life of 70 years. Where the Department desires the Concessionaire to carry out the rehabilitation, the Concessionaire will produce a schedule of work required and agree with the Department a schedule for carrying out such work as a Department Change.

- F. The Concessionaire shall provide new storm water management facilities and for the replacement of capacity for any existing storm water management facilities that may be removed in accordance with applicable standards and specifications set forth in Attachment 1.5a.
- G. No drainage inlet grate or at-grade structure will be permitted to be located or extend within the travel way of the Interstate or the associated Interstate ramps, unless otherwise approved by the Department.
- H. Prior to the commencement of construction Work, the Concessionaire will determine all existing drainage facilities the Concessionaire intends to utilize and leave in place for continued use (pursuant to the Agreement). The Concessionaire shall perform such activities as may be necessary to cause such facilities to be completely clean and free of debris and silt prior to commencement of construction Work on or near such existing drainage facilities. The Department shall pay to the Concessionaire, the Concessionaire's Allocable Costs for such cleaning activities. Following this initial cleaning, the Concessionaire shall be responsible, at its sole cost and expense, for cleaning any debris or silt accumulation caused by performance of the construction Work.
- I. As part of the Work and in accordance with Good Industry Practice, the Concessionaire may tie in or connect new drainage assets it is designing and constructing to existing drainage assets present along the I-95/395 Corridor as of the Agreement Date. If there is an existing drainage asset the Concessionaire desires to tie in or connect to, but is prevented from doing so because of physical damage to such existing drainage asset not caused by or attributable to the Concessionaire's activities, the Concessionaire shall repair or replace the existing drainage asset in the immediate area of the proposed tie-in or connection so it can perform the proposed tie-in or connection. Any such repair or replacement work shall be completed in accordance with the standards and specifications set forth in Attachment 1.5a. Where the Department desires the Concessionaire to carry out the repair work, the Concessionaire will produce a schedule of work required and agree with the Department on a schedule for carrying out such work as a Department Change.

- J. 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 Concessionaire proposed tie-in or connection. In that case, the Concessionaire 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 1.5a) in order to accommodate the proposed tie-in or connection.
- K. All existing culverts, storm sewer, and drainage appurtenances to be abandoned shall be removed or filled and plugged with flowable fill.
- L. See Structures and Bridge Section for bridge deck drainage requirements.
- M. For all impacted permanent structures, the bridge, hydrology, hydraulics, and scour requirements shall be in accordance with the requirements set forth in Attachment 1.5a, including but not limited to AASHTO Load and Resistance Factor Bridge Design Specifications (the more stringent requirements shall govern).
- N. The Concessionaire will perform a comprehensive design analysis for impacted major culvert and/or bridge-crossing locations where the 100-year discharge is 500 cfs or more, and/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 1.5a. The Concessionaire will ensure the hydraulic analysis is coordinated with the bridge design when bridges over waterways are involved.
- O. The scour analysis and reporting shall be in accordance with the standards and specifications set forth in Attachment 1.5a and shall include all existing structures undergoing Major Rehabilitations 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 1.5a.
- P. The Concessionaire will 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.

- Q. During the Work period the Concessionaire shall provide for positive drainage of all roadway facilities open to construction traffic. Construction activities shall not redirect or add drainage run-off to a private property.
- R. Where justified by site conditions within the HOV/HOT corridor north of Prince William Parkway (from station 812+00 to station 1558+00), the Concessionaire may submit a design for the slotted barrier drains and trench drains for VDOT review and acceptance. However, for all other locations and the general purpose lanes, such use of slotted barrier drains and trench drains would not be accepted.

3.7 Roadway Design

3.7.1 General Requirements

Concessionaire will prepare the final geometric design of the roadway elements in accordance with Good Industry Practice. Functional classifications for roadways and specific design criteria on the Project are to be developed per the standards and specifications set forth in Attachment 1.5a.

- A. The design speed for the HOT Lanes shall be 65 miles per hour from the Turkeycock Ramp Interchange to just south of Dumfries Road (station 442+00); and 70 miles per hour from just south of Dumfries Road (station 442+00) to Garrisonville.
- B. Except as outlined in design exceptions and design waivers, the HOT lanes and shoulders shall meet the Department's criteria for freeways, as described in the standards and specifications set forth in Attachment 1.5a. The widths of reversible shoulders shall be equal and meet the wider criteria established in the Department and FHWA criteria.
- C. Concessionaire will have the flexibility to propose revised designs that produce time and cost benefits to the Department and/or the Concessionaire without impairing the essential functions and characteristics of the design, including safety, traffic operations, desired appearance, maintainability, environmental protection, drainage, and the constraints of any Regulatory Approvals. In accordance with the Agreement, the Technical Requirements, or the above conditions, the Department will have the right to accept or reject such revised design criteria or designs.
- D. Except as outlined in design exceptions and design waivers, reversible ramp shoulder widths will be equal and the widths will be the wider width as identified with a one way ramp in the standards and specifications set forth in Attachment 1.5a.

- E. All new and existing ramps will be designed with a parallel design. Acceleration and deceleration lengths will be designed to meet AASHTO requirements including operational characteristics of the ramp and desirable lengths unless constraints prohibit this desirable length and the reduction justification is approved by the Department.
- F. In order to preclude toll violations and wrong-way access, Concessionaire will provide a continuous physical barrier system throughout the corridor. Cross-overs from the GP lanes to HOT lanes will have overlapping barriers-and-gates systems. The Department will have the final approval on the location and type of such barrier system.

3.7.2 Requirements for Operational Analysis

The Concessionaire, in coordination with the Department, shall provide an operational analysis for any changes to the I-95 HOV/HOT Lanes design as presented in the Design Public Hearing that require an amendment to the I-95 HOV/HOT Lanes Interchange Justification Report.

- A. The operational analysis shall demonstrate that the Concessionaire's revised design does not have a significant adverse impact on the safety and operation of the existing facility based on an analysis of current and future traffic. Traffic and operational analysis shall conform to the requirements of IIM-LD-200.4 *Development of Justification for Additional or Revised Access Points: Creation of Interchange Justification/Modification Reports*.

3.8 Pavement

- A. Pavements shall be designed and constructed to meet or exceed the minimum pavement section requirements set forth in Attachment 1.5a. Pavement design and construction shall meet the requirements of the federal pavement policy, 23 CFR 626 (Chapter 1).
- B. The pavement for the Project on new alignment, south of the current HOV terminus at Dumfries, which shall be maintained by the Concessionaire, may be designed and constructed to meet the performance requirements for the applicable roadway classification and the design-year traffic as detailed in "VDOT Requirements for Geotechnical Investigations, Geotechnical Design and Minimum Pavement Sections for I-95 HOV/HOT Lanes", dated July 18, 2011 included in Attachment 1.5a. However, the pavement structure for the Project shall incorporate CTA and drainage layers pursuant to the standards and specifications set forth in Attachment 1.5a.
- C. Pavements that will be maintained by the Department following Substantial Completion shall be designed and constructed in

accordance with modified WP-2 (including matching the existing pavement layer types and thicknesses) and the standards and specifications set forth in Attachment 1.5a. Modified WP-2 means one-foot wide, two-inch deep mill and overlay from the sawcut line.

- D. Pavements shall be designed to ensure positive drainage on the pavement surface and within the pavement structure, including connecting to existing or any new sub-drainage systems. Standard UD-1 underdrains shall be installed in wet areas, areas of high groundwater, and in cuts greater than 25 feet.
- E. Any pavement reconstruction on arterials or local streets shall be designed to meet the design-year traffic and match the existing pavement type at tie-in in accordance with modified WP-2 and in accordance with the Department’s pavement design standards and guidelines.
- F. Approach slabs for all bridges shall be full width – from face to face of barrier/parapet (including extending under sidewalks and shared-use paths).
- G. In order to meet the Handback Requirements, prior to the expiration of the Term, the Concessionaire shall ensure, at its sole cost and expense, that pavements for the HOT Lanes constructed as part of the Project meet the following requirements:
 - 1. Pavements shall have minimum sections as specified in the standards and specifications set forth in Attachment 1.5a, including but not limited to “VDOT Requirements for Geotechnical Investigations, Geotechnical Design and Minimum Pavement Sections for the I-95 HOV/HOT Lanes (July 18, 2011).”
 - 2. All HOT Lanes’ shoulders shall include full depth pavement except as provided in “VDOT Requirements for Geotechnical Investigations, Geotechnical Design and Minimum Pavement Sections for the I-95 HOV/HOT Lanes (July 18, 2011)” and on the southern tail, south of station 475+00.
 - 3. All pavements shall satisfy the requirements of modified WP-2.
 - 4. The surface course for all pavements shall have a minimum Critical Condition Index (CCI) value of 75. The CCI defined in “Development and Implementation of Pavement Condition Indices for the Virginia Department of Transportation, Phase I, Flexible Pavements”, K.H. McGhee, September 2002, and used as a “one measure” indicator of overall pavement condition.

- H. Wherever applicable, the design of rumble strips in the paved shoulders shall be consistent with the Standard Documents set forth in Attachment 1.5a.
- I. Concessionaire'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 Concessionaire's final pavement design.
- J. 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 Department's Road and Bridge specifications and applicable special provisions.
- K. The Concessionaire shall submit to the Department for its review, 30 days before the submission of associated final Design Documentation, a pavement design report that documents the assumptions, considerations, and decisions contributing to the Concessionaire'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 information 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.

3.9 Traffic Engineering

3.9.1 General

- A. The Concessionaire 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 1.5a.

- B. All traffic control devices shall be designed and installed to comply with the standards and specifications set forth in Attachment 1.5a and the requirements of the maintaining agency.
- C. The Concessionaire 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 interchange lighting and delineators necessary within the Project limits; and
 - 2. signs outside the Project limits that are necessary to lead traffic to the Project.

3.9.2 Pavement Markings

- A. The Concessionaire shall provide and maintain pavement markings and reflective pavement markers meeting the standards and specifications set forth in Attachment 1.5a.
- B. On any pavement reconstruction undertaken by the Concessionaire, the Concessionaire 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.

3.9.3 Static Signs

- A. The Concessionaire shall design, fabricate, install and maintain all new guide, supplemental, route marker, regulatory and warning signs required for this Project to meet standards and specifications set forth in Attachment 1.5a. The Concessionaire shall also modify or remove any signage outside of the limits of the Project that is no longer appropriate or pertinent to this Project. Shared facilities will be maintained in accordance with Section 4.5 and Attachment 4.5.

- B. The Concessionaire 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-95 corridor and connecting roadways to include proposed sign locations and messages for all guide signs and HOT lane 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 HOT Lanes.
1. The roll plans shall show proposed locations for relocating existing signs, and 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. Submittal of the roll plans to the Department shall occur prior to final design.
- C. The HOT lanes signage scheme will:
1. support the integration of the HOT lanes with the existing road network
 2. facilitate navigation of the road network, including access to, travel along and egress from the HOT lanes,
 3. be consistent with the existing directional and regulatory signing system on the existing road network and the Route 495 HOT Lanes in Virginia Project.
- D. The types of signage that constitutes directional and HOT Lanes signage include:
1. advance direction signs
 2. intersection direction signs

3. trailblazer signs
 4. advance exit signs
 5. exit direction signs
 6. reassurance signs (static and dynamic)
 7. permission signs
- E. Where space allows over traffic lanes, new sign structures and foundations (full span and cantilever) shall be designed to accommodate an additional static sign load of 200 sq. ft. for future use.
- F. The Concessionaire shall be responsible for planning, coordinating, and obtaining Regulatory Approvals, if required, and removing and disposing of structures and obstructions. The Concessionaire 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 Final Acceptance.
- G. 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.
- H. The Concessionaire shall be responsible for coordination with the Department or the pertinent local agencies or jurisdictions in order to install directional signage, including, without limitation, obtaining all applicable Regulatory Approval.
- I. The Concessionaire shall adjust all signage within the construction limits whose messages 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 Final Acceptance.
- J. The Concessionaire shall provide the necessary guide, warning and regulatory signs for the Project.
- K. The Concessionaire shall maintain all existing signs during construction, unless they are to be removed permanently or have been replaced as required by the Project. For any existing signs that require relocation due to construction, the Concessionaire shall present pertinent details – such as sign designs, mounting details, locations etc. – for the Department’s review and comment, prior to relocation.

- L. The Concessionaire shall modify or remove existing signs and structures that are rendered inaccurate, ineffective, confusing or unnecessary. The Concessionaire shall obtain the Department's approval prior to making any such changes.
- M. The Concessionaire 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 Concessionaire 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 Concessionaire for each existing sign structure identified by the Concessionaire.
- N. The Department will review the structural analysis provided by the Concessionaire for each sign structure to determine whether or not the existing structure and and/or sign can be modified as proposed. If it is determined that modifications to the existing sign structure and/or signs are not structurally acceptable, the Concessionaire shall provide new signs and structures, in accordance with Attachment 1.5a, to replace the existing sign structures and signs.
- O. Lighting conditions shall conform with the Department's standard lighting requirements for freeway operations and shall be subject to the Department's approval. Signs shall incorporate highly reflective sheeting material to optimize lighting installation.
- P. Post Interchange Signs (as defined in MUTCD Section 2E.35) shall be installed on the Project in accordance with applicable standards where space and/or permanent structures permit.
- Q. The Concessionaire shall place milepost and intermediate markers at 0.2 mile intervals facing northbound on the right side of the roadway on the reversible lanes and facing southbound on the left side of the roadway and for the new interchange ramps connecting the Springfield Interchange Phase VIII roadways and structures.
- R. The milemarkers shall conform to MUTCD Figure 2H-2, Reference Location Signs, and intermediate markers shall conform to MUTCD Figure 2H-3, Intermediate Reference Location Signs.
- S. For signing along the mainline, all guide signs, dynamic message signs and supplemental guide signs on overhead structures shall be installed such that 800 foot minimum spacing is maintained between signs. In

areas where the 800 foot minimum spacing cannot be maintained the Concessionaire shall obtain a design waiver/exception from the Department to reduce the spacing.

- T. The limits of directional and HOT lanes signage for the Project for which the Concessionaire is responsible extend to provide sufficient information to users of the HOT Lanes for direction and access purposes to all entry and exit points.
- U. The Concessionaire shall perform line of sight analysis for all sign structures as necessary to confirm drivers have sufficient time to read the sign messages, and signs are not visually obstructed.
- V. The Concessionaire 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.

3.9.4 Traffic Signals

- A. The Concessionaire 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 1.5a.
- B. The Concessionaire 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 shall provide reasonable assistance to the Concessionaire in obtaining the relevant design requirements from any maintaining agency.
- C. The Concessionaire shall provide communications between all temporary 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 Concessionaire shall design, program, adjust controller timings, test, and commission the new signalized intersections for coordinated operations matching the maintaining agency's existing coordination plans. The Concessionaire shall provide timing for existing signal coordination plans.

2. The Department or the maintaining agency will test and commission any new local signalized intersection for network operations with the existing traffic signal system and will re-time network signals, as needed, to accommodate network demand.
 3. The Department will optimize traffic signal timing at intersections with HOT 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 HOT Lanes or the approaching roadways.
- E. The Concessionaire shall keep the existing signalized intersections within the Rights of Way functional during the Work period. If signals must be shut down, the Concessionaire shall provide temporary signals or appropriate traffic controls. Temporary signal shut down shall not be permitted.
 - F. For each phase defined in the MOT Plan and temporary traffic control plans, the Concessionaire shall develop signal timing plans for the Project and roadways designated as detours and submit the plans to the Department. The Concessionaire shall implement, test, and adjust signal timings to prevailing conditions. The Concessionaire shall develop signal timing plans for all peak and non-peak periods which may require more than eight (8) plans.
 - G. The Concessionaire 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, installation, rehabilitation of disturbed areas, and acquiring power and communication connections.
 - H. The Concessionaire shall install and connect power service for temporary and permanent traffic signals for the Project.
 - I. Conductor/communication cables shall be placed in buried conduit, embedded conduit, and structure and bridge-mounted conduit.
 - J. The Concessionaire shall not open trench any existing pavement for the installation of conduit, except in areas that will be overlaid or rebuilt. For overlays over trench areas, the new pavement section shall match the existing pavement section.

3.9.5 Roadway Lighting

- A. **Lighting During Construction.** The Concessionaire shall preserve all existing lighting assets along the I-95 Corridor throughout the Construction Period in order to avoid a diminution of the existing lighting conditions for a period of more than 30 days unless otherwise

approved by the Department. The Concessionaire may accomplish this by staging its construction operations for the repair or replacement of existing lighting assets impacted by the Work is completed within 30 days of such assets being taken out of service or otherwise impacted so as to cause a diminution of the existing lighting conditions. If the necessary repair or replacement of an existing lighting asset cannot be completed within the 30 day period, the Concessionaire shall provide, prior to the expiration of the 30 day period, temporary lighting equipment until the completion of the repair or replacement Work.

- B. **Lighting for HOV/HOT Lanes South of Existing Terminus.** A lighting warrant analysis will be performed and submitted as part of lighting Design Documentation to the Department for review and approval. The Concessionaire will, at its sole discretion, determine where lighting is required.
- C. **Requirements for Lighting Design.** All lighting design shall:
 - 1. be prepared in accordance with the *USDOT Roadway Lighting Handbook*;
 - 2. be performed using AGI-32 computer software; and
 - 3. include point-to-point lighting analysis and calculations submitted to the Concessionaire for review and approval.
- D. **Lighting for HOV/HOT Lanes.** New or modified lighting shall consist of:
 - 1. Partial Interchange Lighting for new or modified entry and exit connections to the HOV/HOT Lanes.
 - 2. Underpass lighting, where required by *VDOT Traffic Engineering Design Manual*, for new Concessionaire-constructed I-95 bridge structures where the structures form an overpass or underpass on the Project.
- E. **Lighting Required as Mitigation.** As first order of precedence, the Concessionaire, 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 1.5c, or by the IJR.

3.9.6 Power

- A. The Concessionaire 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.

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- B. Where new duct bank is installed, south of I-495, the Concessionaire shall provide and install, for the Department, power conduit along or adjacent to the Project, consisting of:
1. two (2) two-inch Department conduits;
 2. separate junction boxes for VDOT access;
 3. new power cable from existing Department assets served by the existing duct bank to the nearest power source; and
 4. power within existing duct bank shall be de-energized and safely abandoned per industry standards.
- C. The Concessionaire 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, except any new power feeds required from an electrical utility, will be paid for by the Department in accordance with the following terms:
1. The Department will compensate the Concessionaire for each location where a new power feed is determined to be necessary. Concessionaire will make commercially reasonable efforts to utilize existing Department facilities.
 2. Compensation by the Department will be limited to reimbursement to the Concessionaire (and Design-Build Contractor), for the actual expenses plus 18% markup incurred to provide the new power feed as evidenced by an invoice submitted to the Department by the Concessionaire of these costs.
 3. Payment will be made monthly, when submitted by Concessionaire, against the combined allowance budget of \$15,000,000 that includes this item, concrete sign foundations, and undercut, until the budget amount is reached. Any amounts exceeding the budgeted Department allowance for the combined total of these items will be borne by the Concessionaire.
- D. The Concessionaire shall install and have connected power service for new or relocated traffic signals and lighting (sign, roadway, and interchange) for the Project.

- E. The Concessionaire shall provide back-up electrical power service to support Operations and Maintenance Work in emergency situations where the primary power source is not available, where practical.
- F. The power supply for the ETTM Equipment shall be separately metered.
- G. Where approved by the Department, new HOT Lanes lighting, ITS and TMS roadside equipment may be connected to existing Department electrical service panels.
- H. The Concessionaire shall provide back-up power for the operations of the gate systems which includes the reversible gates, the pricing confirmation DMS sign, CCTV cameras, and other HOT Lanes ITS if part of the gate system.

3.10 Fences and Barriers

- A. The Concessionaire 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.
- B. The Concessionaire shall perform a safety risk analysis to determine whether fencing should be used to separate the sound wall erection work zones from adjacent properties and, if such analysis shows that fencing is required, the Concessionaire shall provide temporary six-foot-high (minimum) chain link security fencing at any such locations.
- C. Glare screens or extended height barriers shall be installed on all concrete median barriers separating the HOT Lanes from the GP Lanes with glare conditions.
- D. 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 1.5a.

3.11 Aesthetics

- A. Aesthetic treatments shall be designed to be consistent with the local landscape and architecture, as well as the developed themes of the local setting. The Concessionaire shall coordinate with local and state agencies to develop an aesthetic concept to achieve this required consistency, including coordination with the State Historic Preservation Office, as applicable, while maintaining applicable design standards.

- B. The following items will be considered in defining the aesthetics concepts for the Project design:
1. material, finish, color, and texture of sound walls, retaining walls, bridge barriers, parapets walls, abutments, wingwalls, and piers;
 2. paved slope treatments and hardscape at interchanges and intersections;
 3. median or other specialty paving, including material, finish, and color;
 4. fencing;
 5. signage (including overhead, attached, ground-mounted, and gantries);
 6. lighting poles and lamps; and
 7. any permanent building construction for the Project, including ancillary support, operational, and toll collections.
- C. All permanent structures shall be carefully detailed to achieve the greatest level of aesthetic quality and fit in accordance with (A) above. All permanent structures shall be proportioned to avoid excessive size, bulk and mass, and shall also be in accordance with the requirements set forth in Attachment 3.11 except if more stringent aesthetic requirements are required as a result of coordination efforts as outlined in (A) above.
- D. Graphics, signage, and lighting shall be consistent along the entire length of the Project.
- E. Aesthetic elements shall be easy to maintain and resistant to vandalism and graffiti.
- F. Aesthetics elements shall be fully integrated with the overall landscape design.
- G. Where existing structural elements that are to be incorporated into the Project have aesthetic treatments, the surface finish and color for sound walls, retaining walls, bridge parapets and walls, and bridge abutments shall match existing.
- H. Where structural elements have no aesthetic surface treatments specified, elements shall receive a smooth concrete finish in

accordance with the standards and specifications set forth in Attachment 1.5a.

3.12 Landscaping

- A. Landscaping will be handled as a Department Change. This shall include design and installation of plant material, sodding, associated watering, and necessary maintenance. Stabilization of disturbed areas of the project to maintain permit conditions is not included in the landscaping Department Change.
- B. Prior to the Concessionaire beginning any work associated with landscaping, the Concessionaire must receive a request for Department Change in accordance with the Agreement.
- C. Progress payments will be made monthly by the Department in accordance with the Agreement.

3.13 Capital Asset Facilities

- A. If the Concessionaire constructs a building within the Right of Way on state property, except for any of the ETTM Facilities, the Concessionaire 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 Concessionaire shall have the building inspected by BCOM to obtain an occupancy permit. Also any building project constructed on state property costing \$100,000 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 Concessionaire's request will be desired or accepted. The Concessionaire'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 Concessionaire shall obtain any other permits and approvals required under Law.
 - 1. If the Concessionaire 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 Concessionaire shall obtain building permits and Regulatory Approvals for construction and occupancy.
- D. The Concessionaire shall procure any zoning variances required for construction and occupancy.
- E. If the Concessionaire should seek to construct a building at one of the Department's maintenance facilities, the same requirements for construction outlined above will apply. The Concessionaire will be required to sign a lease agreement to construct a new building or to lease all or part of the Department's existing facilities at one of these locations. A minimum of four months would be required to obtain a lease which would require the Governor's approval.
- F. If the Concessionaire buys property outside of the Project Right of Way 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 Concessionaire buys vacant property that will ultimately be owned by the state at the end of the Term, the Concessionaire will be required to have building permits and occupancy permits for any new structures. If the Concessionaire buys land with existing buildings and the property will ultimately be owned by the state, the Concessionaire will have to obtain an occupancy permit approved by BCOM.
- G. If the Concessionaire buys property outside the Project Right of Way, 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 Concessionaire shall clean the property to standards acceptable to the state before the property will be approved/accepted by the Department.

3.14 Bicycle and Pedestrian Facilities

- A. The Concessionaire shall design and construct the Project to include all existing and planned pedestrian and bicycle facilities within the Project limits, as described in Table 3.14 below.

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- B. All existing pedestrian and bicycle facilities shall be maintained throughout construction until permanent facilities can be fully opened. Any temporary pedestrian or bicycle facility closure request shall be submitted in writing to the Department for review and comment.
- C. All new facilities and modifications to existing facilities will be designed in accordance with the standards and specifications set forth in Attachment 1.5a. Where a box culvert is replaced along a proposed or existing trail, the replacement shall have sufficient width and vertical clearance to accommodate a shared-use path adjacent to the stream. The walking surface of the path shall be located above the five-year storm.
- D. If applicable, the Concessionaire shall conduct coordination meetings with all local jurisdictions and the Department to ensure all existing and planned pedestrian and bicycle facilities are identified along the Project corridor.
- E. If applicable, the Concessionaire shall coordinate with the Department’s District Bicycle Pedestrian Coordinator and local jurisdictions on the design, maintenance of traffic and construction staging of the bicycle and pedestrian facilities within the project limits.
- F. All pedestrian signal displays shall be countdown signals. Pedestrian pushbuttons shall be a minimum of 0.5 cm (2 in) across in one dimension and shall contrast visually with the housing or mounting.
- G. Pavement designs for sidewalks and paths shall include a minimum four inch layer of Aggregate Base Material Type 1, Size 21 B, or comply with site and subsurface conditions, whichever is greater.
- H. The Concessionaire shall design and provide drainage, if needed, for any new independent pedestrian or shared-use path bridge. Drainage scupper grates on the bridge should preferable be located within the 2-foot shoulder of the path.

Table 3.14 Pedestrian and Bicycle Facilities Within the Project Limits					
Approximate Stationing	Bridge/Culvert	VDOT Bridge Number	FTU Bridge Number	Existing Conditions	Proposed (HOT Lanes Project)
196+25	Telegraph Road	2048	71	No existing pedestrian facilities	8 foot shoulders
376+00	Joplin Road (beneath existing and	New	68	No existing pedestrian	New HOV/HOT Bridge length shall match adjacent existing bridge length

Table 3.14 Pedestrian and Bicycle Facilities Within the Project Limits					
Approximate Stationing	Bridge/Culvert	VDOT Bridge Number	FTU Bridge Number	Existing Conditions	Proposed (HOT Lanes Project)
	proposed bridges			facilities	per 3.15.3 Design requirements.

3.15 Structures and Bridge

3.15.1 General

A. Type of Structures

1. Bridges;
2. Bridge Class Culverts including “tunnels” below embankments for local access between property;
3. Buildings for storage, system equipment structures, occupation, etc.;
4. Retaining Walls;
5. Overhead Sign Structures;
6. High Mast Lighting Poles;
7. Light Poles;
8. Traffic Signal Poles;
9. Sound Walls; and
10. Toll Gantries

3.15.2 Definitions

A. Permanent Structures

1. Permanent structures include but are not limited to bridges, retaining walls, sound walls, bridge class culverts, sign structures, lighting structures, and system equipment structures, toll gantries, control rooms, and other buildings.
 - i. A "bridge class culvert" is defined as follows:
 - a. a culvert having an opening measured along the center of the roadway of more than 20 feet

between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening; or other culverts that may be defined as a bridge class culvert in accordance with National Bridge Inspection Standards, the Code of Federal Regulations (23 CFR 650.3), and/or

- b. Culverts that do not meet National Bridge Inventory definitions and have an opening equal to or greater than 36 square feet, and bridges less than 20 feet between undercopings of abutments or between springlines of arches as defined in IIM-S&B 27-Bridge Safety Inspections.
2. In addition to the requirements in this section and the standards and specifications set forth in Attachment 1.5a, the Concessionaire shall meet the scope items and additional requirements outlined in Attachment 3.15a for bridges.

3.15.3 Design

- A. The Concessionaire shall comply with the Structural Design Criteria (Attachment 3.15b).
- B. Design Standards
 1. All new bridges, bridge replacements and/or widening of existing bridges, new culverts and retaining walls, and modifications to existing culverts and retaining walls shall be designed in accordance with AASHTO Load and Resistance Factor Design Bridge Design Specifications (“AASHTO LRFD”) and all current revisions and Department modifications issued as of August 15, 2011. All other structures shall be designed to the appropriate design specifications set forth in Attachment 1.5a.
 2. The Concessionaire shall comply with the Department’s Manuals for the Structure and Bridge Division – Volume V Series.
 3. The Concessionaire shall comply with the Department’s Road & Bridge Standards, Vol. I & II (2008 including latest revisions issued as of August 15, 2011). Should any standard

for retaining walls and culverts not be in accordance with AASHTO LRFD, then the Concessionaire shall verify design and/or implement a modified version of the requirement such that it is in compliance with AASHTO LRFD.

4. In order to ensure not precluding future pedestrian or Department Shared Assets, all new mainline bridges designed for the HOV/HOT lanes shall, at a minimum, match the length, face to face of abutments, of the adjacent existing general purpose lane bridges. Furthermore, no proposed substructure component, including piles / shafts, shall project into a clearance envelope defined by two vertical planes offset seven (7) feet from the front face of footing at the two abutments and in the horizontal plane located five (5) feet below the underpassing roadway grade.

C. Details and Drawings for Permanent Structures

1. All details and drawings should be in accordance with the Department's Manuals of the Structure and Bridge Division – Volume V Series.
2. Details and drawings not specifically included in the Manuals of Structure and Bridge Division – Volume V Series may only be included in structural plans and working drawings after review and approval by the Department. Should any such details not be acceptable, the Concessionaire shall make the necessary modifications or shall submit an alternate detail that is acceptable to the Department.
3. Any repairs and/or modifications to existing bridges or structures shall be designed, detailed and submitted to the Department as a plan package for review and approval.
4. Retaining walls associated with any bridge shall be included with the bridge Stage II plan submittal package. Shop drawings for these retaining walls are not required at the Stage II plan submittal.
5. The use of continuous span units and jointless bridge design technologies shall be used as outlined in the Department *Manuals of the Structure and Bridge Division - Volume V Series*.
6. File No. 06.07 of Volume V – Part 2, of the *Manuals of the Structure and Bridge Division*, shall be extended as follows: Approach slabs shall be full width – from face to face of barrier/parapet (including extending the approach slab under

sidewalks, shared-use paths, medians, and/or other such features).

7. On the plans, all deep foundation units shall be numbered.

3.15.4 Construction

The parapet and barrier walls on bridges can be constructed using slip forming if the quality provided matches the quality of a cast in place parapet or barrier wall, as determined by the Department after review of trial construction.

3.15.5 Existing Bridges & Structures

If the Concessionaire modifies, widens or impacts structural elements of any existing bridge, then the Concessionaire is required to provide a design and plan set for the modifications and/or widening that is consistent with Attachment 1.5a-Standards and Specifications and Attachment 3.15b - Structural Design Criteria.

3.15.5.1 Live Load Carry Capacity of Modified Bridges

- A. All modifications to existing bridges shall be evaluated for their impacts on the live load carrying capacity 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.
 1. If the current HL93 Rating Factor (as computed per the 2011 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.
 2. If the current HL93 Rating Factor (as computed per the 2011 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.

3.15.5.2 Modifications to Existing Bridges:

- A. Modifications to existing bridges shall be carried out in accordance with the Agreement unless otherwise specified.
- B. The Concessionaire will be permitted to only bring all safety features (e.g., railings) up to current standards provided all the requirements set forth below are satisfied for either of the two scenarios:
 1. Scenario 1

- i. The Work only involves increasing the number of lanes and/or reducing the width of one or both shoulders.
 - ii. The Concessionaire has obtained a design exception or design waiver, as applicable, to permit a sub-standard deck width so as to allow the subject deck to not be widened.
 - iii. The Work required to bring all safety features (e.g., railings) up to current standards requires only that the deck overhangs be reconstructed.
 2. Scenario 2
 - i. The Work required to bring all safety features (e.g., railings) up to current standards and add sound walls to the existing bridge requires only that the deck overhangs be reconstructed.
- C. In addition to the requirements in this section and the standards set forth in Attachment 1.5a, the Concessionaire shall meet the scope items and additional requirements outlined in Attachment 3.15a.

3.15.5.3 Major Rehabilitation of Existing Bridges

- A. Major Rehabilitation is defined as the following Work:
 1. restoring the structural integrity of an existing bridge;
 2. correcting major safety defects (e.g., railings, approach guardrails, lane widths, shoulder widths);
 3. a bridge deck or superstructure replacement (both partial and complete); and/or
 4. the widening of a bridge.
- B. The scope of Work for bridges undergoing a Major Rehabilitation shall be as follows:
 1. the Concessionaire shall complete a comprehensive inspection and evaluation to determine all repairs that are necessary;
 2. Work necessary to bring all safety elements (e.g., railings, approach guardrails, lane widths, shoulder widths) up to current standards; and

3. all Work necessary to restore the structural integrity of an existing bridge including all repairs necessary to satisfy the following requirements:
 - i. to bring the condition ratings for the Deck (Item 58), Superstructure (Item 59), Substructure (Item 60), and Channel and Channel Protection (Item 61) to a Level of 7/"Good" or better as defined in the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges;
 - ii. to bring all of the element ratings (including sub elements) on the Department Structure Inspection Reports (including deck, expansion joints, superstructure, substructure abutments, piers, channel and slope protection, other approach pavement) to a level of 7/"Good" or better (the term "Good" shall be a condition similar to that as described in Items 58 through 62 in the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges;
 - iii. to complete the minimum requirements noted below for bridge decks where defined as "Defective Deck Areas" pursuant to the "Guidelines for Deck Testing of Existing Structures to be Widened," File No. 1-03.15-1 (1 through 5), Volume IV of the *Manuals of the Structure and Bridge Division*:
 - a. a deck condition survey is not required for bridges that were constructed after 1990 that have a current condition rating for the deck (Item 58) of 7/"Good" or better as defined in the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges
 - b. patching and overlay of decks with modified latex hydraulic cement concrete (MLHCC) or silica fume concrete if the "Defective Deck Area" is equal to or greater than 10% of the total deck area
 - c. if proper curing of the MLHCC or silica fume concrete exceeds the work restrictions specified elsewhere in the Agreement, then the

Concessionaire will be permitted to use deck patching and epoxy overlays

- d. replace the deck in the following situations: if the “Defective Deck Area” is equal to or greater than 30% of the total deck area, or if the life-cycle cost analysis shows that it is more cost effective to replace the deck than it is to patch (including removal of all defective deck area) and overlay the deck (including overlay replacements)
 - e. replace the entire bridge if a life-cycle cost analysis shows that it is more cost effective to replace the entire bridge than it is to rehabilitate the bridge
- iv. to bring the entire bridge up to current standards as defined in Attachment 1.5a (unless a design exception or design waiver is approved, as applicable); and
 - v. the retrofitting of bridges as follows (unless the Concessionaire can show to the satisfaction of the Department that such retrofitting is not necessary):
 - a. retrofit all members, using techniques such as Ultrasonic Impact Testing (UIT), with a fatigue stress category D, E, E^c, E’, and F so that the members can perform for the remaining service life of the bridge without any potential for fatigue distress or damage;
 - b. retrofit all details, members, and/or connections, using techniques such as UIT, that are susceptible to fatigue distress or damage (such as pin and hanger details, fracture critical members, or features of a bridge with distortional forces) so that the member can perform for the remaining service life of the bridge without any potential for fatigue distress or damage.
- C. The comprehensive inspection and evaluation of the existing bridge mentioned above, to be completed by the Concessionaire, needs to determine and document the extent of deterioration, distress, and repair needs. The inspection and evaluation shall include, but not be limited to, the requirements below.

1. The inspection shall be comprehensive and include the entire bridge and surrounding features.
 2. Work includes access equipment, non-destructive testing and maintenance of traffic.
 3. The Department will be given four weeks notice of the inspection, and representatives will be given unfettered access to the bridge site at no cost to the Department (including use of access equipment) during the inspection.
 4. All distress and damage will be documented, an evaluation of the most appropriate repair/rehabilitation strategy, and the proposed repairs will be included with the Stage I (Preliminary Plans) submission. Typical repair items are outlined in Attachment 3.15a.
 5. The inspection shall include a full deck condition survey.
 6. The deck condition survey and repair/rehabilitation strategies shall be in accordance the following guidelines:
 - i. Items 3 and 4 of the section entitled “Preliminary Phase” of the “Repair Rehabilitation, Deck Investigations,” IPPM-35(03), Design Section, Internal Policy/Procedure Memorandum, Structure and Bridge Division, Salem District.
 - ii. Guidelines for Deck Testing of Existing Structures to be Widened, File No. 1-03.15-1, Volume IV, Manuals of the Structure and Bridge Division.
- D. In addition to the requirements in this section and the standards and specifications set forth in Attachment 1.5a, the Concessionaire shall meet the scope items and additional requirements outlined in Attachment 3.15a for bridges to receive a Major Rehabilitation.

3.15.5.4 Dismantling and Removing Existing Structures or Removing Portions of Existing Structures

- A. The Concessionaire shall follow the steps for Conducting an Asbestos Assessment, Hazmat Clearance and Removal of Asbestos Containing Materials as outlined in Attachment 1.5a, Department Memorandum, *Asbestos Containing Material on Bridges*.

3.15.5.5 Modifications to Existing Retaining Walls

- A. The Concessionaire shall bring all safety elements of existing retaining walls up to current standards (example: railings) if the roadway, above and behind the retaining wall is changed in any way (example: shoulder width is reduced, lanes are added, road classification is changed) unless the Concessionaire obtains an approved design exception or design waiver, as applicable.
- B. The Concessionaire shall complete the following Work if any significant work is completed on an existing retaining wall:
 - 1. all safety elements of the existing retaining wall shall be brought up to current standards (example: railing); and
 - 2. ensure that the modified/retrofitted retaining wall meets the requirements of the Agreement.

Significant Work includes, but is not limited to, the following:

- 1. raising the existing retaining wall;
- 2. adding a soundwall or other feature to an existing retaining wall; or
- 3. any other Work that increases the load, or decreases the structural or geotechnical capacity, of the existing retaining wall.

3.15.5.6 Modifications to Existing Culverts

- A. If the Concessionaire extends and/or modifies structural elements of any existing Bridge Class Culvert, then the Concessionaire is required to provide a design and plan set for that extension and/or modifications. The Department will provide existing as-built documents if available.
- B. Work to Bridge Class Culverts shall be in accordance with and consistent with the Agreement.
- C. All modifications to existing culverts as identified in the Agreement shall be evaluated for their impacts on the live load carrying capacity 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.
 - 1. If the current HL93 Rating Factor (as computed per the 2011 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.

2. If the current HL93 Rating Factor (as computed per the 2011 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.

3.15.6 Toll Gantries

- A. The design for the structures, toll gantries, and supports for the violation enforcement, traffic management system (TMS) and tolling system roadside equipment will be standardized. The toll gantries shall be designed and detailed in accordance with Attachment 3.15b.
- B. The design for toll gantries will accommodate the following:
 1. toll and enforcement equipment dead loads and performance requirements; and
 2. natural frequency requirements
- C. The vertical deflection of the toll gantry will not exceed the equipment manufacturer's desirable design specification.
- D. The toll gantry columns and beams will be fabricated of galvanized steel.

3.15.7 Barrier Protection of Structures

- A. Barrier Protection of Structures shall satisfy the requirements of AASHTO LRFD, including the requirements of Article 3.6.5 of AASHTO LRFD. This requirement shall also apply to all existing bridges and structures where lanes are added or shoulder widths are reduced or do not meet current standard.
- B. The above requirement shall be extended for following situation: Columns of straddle bent piers shall always be protected by structurally independent, crashworthy ground mounted 54.0-in high barriers in accordance with Article 3.6.5.1 of the AASHTO LRFD.

3.15.8 Plan Submission

- A. The Concessionaire shall make Stage I (Preliminary Plan) Submissions and Stage II (Final Plan) Submissions.

1. Stage I (Preliminary Plan) Submission
 - i. The Concessionaire shall submit a Stage I (Preliminary Plan) submission for each new bridge or major bridge rehabilitation.
 - ii. Stage I submission must be submitted to the Department prior to any design submittal, and at other appropriate times pursuant to the Department's concurrent engineering process. The Department shall not review any final design submittals until the Stage I submission has been approved. The commencement of the final design prior to the approval of the Stage I submission shall be done solely at the risk of the Concessionaire.
 - iii. The approval of the Stage I submission shall be subject to the approval of the detailed hydrologic and hydraulic study and scour analysis of the waterway crossing, and roadway geometry.
 - iv. Stage I submission shall include a Stage I report, drawings and other requirements, and "preliminary plan" requirements indicated in the standards and specifications as set forth in Attachment 1.5a.
 - v. The Stage I report, drawings and other requirements include the following below as set forth in Attachment 1.5a:
 - a. Stage I – Sheet Requirement Checklist;
 - b. Stage I – Plan Review Checklist; and
 - c. Stage I – Report Template.
 - vi. The Stage I report shall follow the "Stage I - Report Template" except as modified below.
 - a. Section 3.10, titled "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).
 - b. Section 6, titled "Bridge Preliminary Recommendation" is modified as follows:

The report need only describe the single alternative selected by the Concessionaire to be constructed;

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

(ii) In Section 6, for new bridges, the report requirements are extended to specifically address the service requirements (including durability and inspectability) in Article 2.5.2 of AASHTO LRFD and why, if applicable, they could not be avoided.

c. Section 7, entitled “Engineer’s Cost Estimate for each Alternative” is not required.

d. Section 8, entitled “Schedule” is not required.

e. 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.

2. Stage II (Final Plan) Submission

i. The Concessionaire shall submit structure Stage II (Final Plan) submission for each new bridge, or major bridge rehabilitation, retaining wall, culvert and modification to retaining wall and culvert structures.

ii. 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 for review and approval by the Chief Engineer prior to construction of that element and should be submitted according to the submission schedule provided by the Concessionaire.

iii. For each bridge, the Concessionaire shall submit estimated quantities as outlined in the Manual of Structure and Bridge Division Vol. V Part 2 Chapter 3.

3.15.9 Bridge Deck Drainage

- A. The Concessionaire shall follow the requirements set forth in Attachment 1.5a.

3.15.10 Railroad and Transit Facilities

- A. The bridge shall be designed to satisfy the requirements of the following, and where these requirements are not in agreement, the Concessionaire shall satisfy the more stringent requirement as determined by the Department and FHWA.
 - 1. Manuals of the Structure and Bridge Division, the Department;
 - 2. Requirements of the owner of the railroad;
 - 3. The American Railway Engineering and Maintenance –of-Way Association; and
 - 4. AASHTO LRFD.
- B. The Concessionaire is responsible for obtaining any approvals from the owner of the facility.
- C. The Concessionaire is responsible for obtaining approval of the Type, Size and Location (TS&L) study from the owner of the facility.

3.15.11 Bridge Mounted Signs

- A. Any existing parapet-mounted sign structures on bridges that are modified by the Concessionaire or located above the HOT Lanes must be removed from the bridge and be replaced with overhead truss or cantilever structures.
- B. New parapet (or girder or beam) mounted sign structures on bridges are not permitted.
- C. Overhead sign structures, unless otherwise approved by the Department, when bridge mounted will only be supported by brackets connected to the superstructure (not parapet mounted). For concrete beam/girder superstructures, bridge deck blisters to support the overhead signs will be considered for review and approval by the Department.

3.15.12 Post Construction

- A. Acceptance for Permanent Structures

1. Acceptance of Permanent Structures will require an initial inspection. The purpose of an initial inspection is to verify compliance with the requirements of IIM-S&B-27 Bridge Safety Inspections, IIM-S&B-73 High Mast Light Poles: Inspection and Maintenance, and IIM-S&B-82 Traffic Structures, and to identify deficiencies, including incomplete work, and variances from approved plans and specifications which must be rectified before the structure can be accepted.
2. The initial inspections shall be performed by the Department. The Concessionaire shall provide the Department with AFC drawings including all revisions at least two weeks prior to scheduling the inspections.
3. An initial inspection shall be performed before any permanent structure is opened to traffic.
 - i. During initial inspection, data about location, date completed, alignment, description, horizontal / vertical clearances, streams, structure element description and condition, and traffic safety features will be gathered.
 - ii. The Concessionaire shall ensure that all structural elements are accessible for inspection of all structures. This requirement may dictate that the Concessionaire provide:
 - a. Man-lifts, barges, remote operated vehicles, bucket trucks, under-bridge inspection vehicles, boats, or other equipment necessary to inspect the structure and
 - b. Plans, personnel, and equipment to implement traffic control measures.
 - iii. Minimum time periods for inspections:
 - a. If only a single bridge is to be inspected, the minimum period for conducting the inspection shall be 4 weeks from the date of receipt of written notice from the Concessionaire.
 - b. If multiple bridges are to be inspected during a given one month period, the minimum period for conducting the inspections shall be 4 weeks plus an additional week per bridge to be inspected.

4. Upon completion of the initial inspection, the Department shall submit an inspection report to the Concessionaire within 10 days of the inspection either recommending acceptance of the structure or identifying deficiencies, including incomplete work, which must be rectified before the structure can be accepted. If a structure is not accepted, the Concessionaire shall rectify the deficiencies and notify the Department in writing, certifying that 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 Concessionaire that the structure is acceptable without a further inspection.
5. The final acceptance of Permanent Structures will occur when the initial inspection is completed and any necessary follow-up (verification) inspections are performed. The initial inspection may be scheduled as more than one inspection as long as it is coordinated with the Department.

B. Load Ratings

1. All new and modified bridges and “Bridge class culverts” shall be Load Rated in accordance with IIM S&B 86-Load Rating and Posting of Structures (Bridges and Culverts) as outlined in Attachment 1.5a.

3.16 Tolling and Traffic Management System

3.16.1 General

The Concessionaire shall be responsible for the planning, design and installation of an ETTM System.

3.16.2 Existing ITS Infrastructure

- A. Pursuant to the terms of the Agreement, the existing Department ITS infrastructure and telecommunication system, to the extent that spare capacity is available within, along, or adjacent to the project corridor, will be made available for use by Concessionaire or its agents or subcontractors in order to support the tolling and traffic management systems.
- B. The existing and proposed / expanded Department owned or operated fiber optic cable in as-is condition will be made available to the Concessionaire to support the ETTM System. A minimum of 3 fiber

pairs will be reserved for use by the Concessionaire for the purposes of both the Project and the Route 495 HOT Lanes in Virginia Project.

- C. Individual conduit with or without innerduct within the existing and proposed / expanded Department owned or operated fiber optic duct bank in as is condition will be made available to the Concessionaire for use by the Concessionaire or its agents or subcontractors in order to provide fiber optic service to the ETTM System with dedicated Department fiber optic cable, installed by the Concessionaire and owned by the Department. Such conduit / innerduct is to be reserved for use by the Concessionaire for the purposes of both the Project and the Route 495 HOT Lanes in Virginia Project.
- D. Maintenance activity for/on fiber optic cable and/or duct bank including junction/splice boxes or manholes jointly occupied by the Concessionaire and the Department, if any, shall be subject to a joint agreement between Concessionaire and the Department.

3.16.3 Business and Toll Operating Model

- A. The business and toll operating model shall comply with the requirements of the Agreement.
- B. A HOT-OC shall be provided to support facility administration, traffic management, incident response, maintenance and tolling operations including handling of services directly related to the operation and maintenance of the HOT Lanes.
- C. Transponders that are read will 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 Interagency Group (IAG).
- D. Equipment shall be installed allowing individual toll sections to be separately charged, with rates appropriate to the prevailing traffic flow conditions on the road.
- E. Toll pricing shall be in accordance with the Agreement.
- F. A Violation Enforcement System (VES) shall be implemented to enable detection, payment collection and toll enforcement for vehicles for which a valid E-ZPass transponder is not read. Enforcement shall follow practices established on similar systems and shall be in compliance with Law. Enforcement may include, but not be limited to, manual processes, video enforcement, integrating customer service, technology and operational performance elements.

- G. An enforcement area shall be provided at or near each tolling point or as agreed by the Concessionaire for enforcement operations to provide a safe location adjacent to the toll gantries or other locations for a law enforcement vehicle.

3.16.4 Systems Integration and Protocols

- A. The Concessionaire shall implement 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 system engineering approach shall address the following items where applicable:
 - 1. system architecture
 - 2. system specification
 - 3. interface identification
 - 4. interface specification
 - 5. interface control
 - 6. system integration
 - 7. configuration management
- B. The HOT Lanes TMS shall be required to interface to the Department's Northern Region Operations (NRO) ATMS at the McConnell Public Safety and Transportation Operations Center (MPSTOC) consistent with the *Capital Beltway I-495 HOT Lanes Program TMS to the VDOT NRO PSTOC ATMS External Interface Control Document (ICD)* and as amended for the Project.
- C. The Concessionaire 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 HOT-OC and the NRO MPSTOC ATMS.
- D. The Concessionaire shall prepare and submit to the Department, the *VDOT ITS Projects – Systems Engineering and Architecture Compliance (Rule 940) Checklist*. The Checklist shall demonstrate that the Project is in compliance with Federal Rule 940.
- E. Subject to the Agreement, the Concessionaire shall ensure that such standards, protocols and interfaces are represented in the HOT-OC

Central Control Computer System (CCCS), so as to make the TMS system interoperable with the NRO MPSTOC ATMS in accordance with the Interface Control Document (ICD), including any mutually agreed revisions during the Operating Period.

3.16.5 ETC AND TMS System Design Documentation

The following ETC system and TMS design documentation shall be prepared and submitted to the Department by the Concessionaire:

- A. Functional Requirements – such requirements shall be documented in the Concept of Operations (Attachment 4.1) and shall include characteristics of the ETTM Equipment with regard to its intended capability, including reversible gate operations and gate control. The documentation shall describe the intended behavior and functionality of the ETC and TMS and the operational interaction with the NRO MPSTOC ATMS.
- B. Technical Specifications - shall be a document or documents that specify the technical design of the integrated sub-systems that will comprise the ETTM System and its interfaces, including reversible operations and gate control.
- C. ICD – shall be a document that describes the physical and logical architecture of system interface between the HOT-OC TMS and the NRO MPSTOC ATMS.
- D. 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 the Department system and/or other systems as required. The process definition deliverable will address reversible lanes and gate operations.
- E. Test strategy – shall establish the principles of, and the Concessionaire’s approach to, the testing of the ETC system and TMS and their interfaces, including the test stages and processes.
- F. Security plan – shall be a document (or part of another document) that sets out how the security of the ETTM System shall meet the relevant requirements for enforcement evidence and that data are held securely and only accessible to authorized personnel.
- G. Disaster recovery plan – shall be a document (or part of another document) that sets out the procedures to be adopted in the event of failure of the ETTM System.

3.16.6 Design of the Electronic Tolling System

- A. The ETC system shall be provided to impose, charge, collect, and enforce payment of tolls and other incidental fees and charges in accordance with the Agreement.
- B. The ETC system is to comprise the following equipment and/or systems:
 - 1. ETC system roadside equipment
 - 2. ETC system equipment and/or subsystems
- C. The ETC system roadside equipment is to comprise:
 - 1. Transponder detection equipment
 - 2. Control equipment
- D. Access to the ETC system overhead and roadside equipment shall be provided such that it does not jeopardize the safety of the technician.
- E. The ETC system shall have a Transponder Transaction Performance of at least 99.90% 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 Concessionaire.
- F. The ETC system and dynamic pricing algorithm module shall:
 - 1. receive data gathered from each road segment on traffic volumes, lane occupancy, and speed data at detection points from the TMS; and
 - 2. adjust toll prices in order to maintain Free-flow traffic conditions in accordance with the Agreement.
- G. The Concessionaire shall provide 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 (Block Box) Interface Specifications*
 6. *Outgoing Correspondence Interface: Virginia Toll Facilities Group – VDOT CSC Specifications*
 7. *VTOLL Interface: Virginia Toll Facilities Group – VDOT CSC Specifications*
 8. *License Plate Interface: Virginia Toll Facilities Group – VDOT CSC Specifications*
- H. The Concessionaire shall develop, 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.
- I. Communication between the ETC system roadside equipment and the HOT-OC shall be via a fully redundant network.

3.16.7 Design of the Violation Enforcement System

- A. A Violation Enforcement System (VES) shall be provided that detects vehicles using the HOT Lanes that do not have a transponder or a valid transponder.
- B. The VES is to comprise:
 1. image capture equipment; and
 2. control equipment.
- C. When tolls for any toll section are suspended, there shall be a means to suspend vehicle enforcement.
- D. The VES roadside equipment shall have an In-service Availability (ISA) of at least 99.90%, excluding the effect of any condition beyond the reasonable control of the Concessionaire.
- E. The Concessionaire shall establish a process to determine vehicle occupancy and undertake related enforcement.

3.16.8 Design of the Technical Shelters

- A. The Concessionaire shall provide suitable technical shelters housing electrical cabinets for the relevant ETTM Equipment as required.

- B. The technical shelters shall be equipped with the following provisions:
 - 1. HVAC systems as required to support installed equipment;
 - 2. fire detection; and
 - 3. intrusion detection.
- C. Each service panel for the HOT Lanes 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. If telemetry is used, it shall be powered by an uninterruptible power source to enable the telemetry to communicate for the first 20 minutes 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.
- 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 will be given to making the floor slab integral with the wall foundation system.

3.16.9 HOT-OC

- A. The Concessionaire shall provide a HOT-OC that complies with the Law to accommodate equipment and personnel for the operation of the HOT Lanes. The Department acknowledges the Concessionaire's plans to construct a single HOT-OC to provide for operations support for both the Project and the Route 495 HOT Lanes in Virginia Project. Accordingly, the Concessionaire's obligations to provide a HOT-OC and perform all related Work pursuant to the Agreement will be satisfied to the extent the Concessionaire complies with its obligations relating to procurement of a HOT-OC under the Amended and Restated Comprehensive Agreement relating to the Route 495 HOT Lanes in Virginia Project.
- B. The Concessionaire shall obtain building permits and other Regulatory Approvals required for the construction and occupancy of the HOT-OC, as required.

- C. The Concessionaire shall procure any zoning variances required for the property to be used for the HOT-OC.
- D. The Concessionaire shall provide a HOT-OC facility with the following amenities, which may include, but not be limited to:
 - 1. offices;
 - 2. meeting rooms;
 - 3. a control room with a video wall;
 - 4. a computer equipment room, with raised computer floor or an equivalent means of distributing cables;
 - 5. restrooms, showers, change room, and lockers;
 - 6. external and internal access security system;
 - 7. HVAC systems;
 - 8. fire detection and alarm system;
 - 9. emergency and backup power;
 - 10. maintenance management rooms and storage; and
 - 11. adequate surface areas for employee and visitor vehicle parking within the constraints of the property boundaries and the remaining site space following the deduction of the building footprint.
- E. The control room shall be equipped with ETC and TMS equipment and shall accommodate the HOT Lanes control staff.
- F. All offices and rooms shall be accessible to all employees and visitors in accordance with the requirements of Law.

3.16.10 Traffic Management System (TMS)

- A. A TMS shall be provided that meets the requirements of the Agreement and enables the Concessionaire to monitor and manage traffic flow on the HOT Lanes.
- B. The TMS must allow the Concessionaire to:
 - 1. support response to emergency situations on the HOT Lanes in the shortest possible timeframe;

2. manage traffic flow on the HOT Lanes;
 3. control reversible flow, including access gates and any regulatory DMS, on and approaching the HOT Lanes;
 4. detect and manage traffic incidents effectively, through a comprehensive incident management system, to mitigate the impacts of incidents and prevent secondary incidents occurring;
 5. provide credible and timely driver information about travel times, traffic conditions and incident situations, contribute to the calculation of dynamic toll prices through the provision of traffic conditions data, and provide timely and accurate toll prices to motorists related to HOT Lanes;
 6. provide an interface with the NRO MPSTOC ATMS in accordance with the ICD;
 7. support provision of driver aid to motorists in vehicles that have stopped on the HOT Lanes;
 8. permit the NRO MPSTOC ATMS to control DMS (HOT Lanes) via the HOT-OC TMS in accordance with the Agreement;
 9. permit the NRO MPSTOC ATMS to control HOT Lanes access gates via the HOT-OC TMS in accordance with the Agreement;
 10. permit the NRO MPSTOC ATMS to change the time periods of reversible flow via the HOT-OC CCCS in declared emergency events in accordance with the Agreement;
 11. provide for the control and monitoring of TMS components and subsystems through a modern and comprehensive computer-based control facility using graphical user-interface (GUI); and
 12. monitor facilities, plant, and equipment, if required.
- C. The TMS is to comprise the following equipment and/or systems:
1. TMS roadside equipment; and
 2. TMS equipment and/or systems located in the HOT-OC/technical shelters.

- D. The TMS roadside equipment is to include:
 - 1. DMS for the HOT lanes to provide toll and driver information and general traffic management information;
 - 2. Pan-tilt-zoom (PTZ) CCTV cameras to provide video surveillance;
 - 3. traffic monitoring sensors to provide traffic volume, lane occupancy, and speed data;
 - 4. lane control devices, if applicable; and
 - 5. roadway gates (and all related systems) at all reversible access points.
- E. The TMS HOT-OC-based equipment and/or systems are to comprise:
 - 1. Automatic Incident Detection (AID) subsystem
 - 2. CCTV subsystem
 - 3. CCCS
- F. The CCCS shall have an ISA of at least 99.995% and the CCCS (redundant components) of at least 99.9%, excluding the effect of any condition beyond the reasonable control of the Concessionaire.
- G. Behavioral studies, market research, and message protocol of other HOT lanes roadways (such as the Route 495 HOT Lanes in Virginia Project) shall be undertaken, as needed, by the Concessionaire to confirm the requirements for the type and format of messages to be provided on the DMS and static signage for optimum information provision. Findings and recommendations shall be provided to the Department for review during the design review process and no later than six months prior to Service Commencement. The type and format of DMS messages must comply with the requirements of MUTCD, guidance published by FHWA, and/or Department practices as appropriate.
- H. The TMS roadside equipment shall have an ISA of at least 99.9%, excluding the effect of any condition beyond the reasonable control of the Concessionaire.
- I. Equipment cabinets shall be provided for the TMS roadside equipment at appropriate locations along the alignment and within the Project Right of Way.

- J. Existing Department-owned TMS roadside equipment that may be taken over by the Concessionaire will be removed or integrated into the new TMS system.

3.16.11 CCTV Video Coverage

- A. Dedicated CCTV cameras shall be provided for the following functions:
 - 1. Surveillance of the HOT Lanes including, approaches and interchanges
 - 2. AID on the HOT Lanes
- B. CCTV video coverage must be provided by PTZ CCTV cameras mounted on poles to enable HOT-OC operators and Department operators (under agreed circumstances in accordance with the Agreement) to observe traffic within the limits of the HOT Lanes at all hours of the day and in all weather conditions normally encountered in Virginia, consistent with reported visibility restriction (i.e., during snow storms, fog, etc.). The video provided must be stable, jitter-free, and suitable for video-based AID.
- C. The Concessionaire shall replace the Department's cameras that are disturbed by the Work.
- D. Dedicated cameras shall be provided for surveillance of the HOT Lanes or to enable video-based AID under Concessionaire HOT-OC operator control.
- E. CCTV line-of-sight distances shall provide for full CCTV coverage without image degradation.
- F. All cameras installed for the Department by the Concessionaire shall meet the requirements of VDOT Special Provision for CCTV Video Equipment and CCTV General Requirements, as included in Attachment 1.5a.
- G. 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.
- H. The video provided must be stable at all zoom settings when viewing objects up to one mile away.

3.16.12 Video-based AID

- A. The Concessionaire may implement video-based AID for the HOT Lanes at locations where:
 - 1. the risk of traffic incidents is expected to be higher than average, and
 - 2. rapid detection of incidents is required for special reasons, such as near critical infrastructure.
- B. The video-based AID system should be capable of:
 - 1. detecting 95% of incidents involving stopped vehicles, slow vehicles, and slow traffic that are within the field of view of an AID camera or other equipment as specified;
 - 2. detecting pedestrians on the roadway within the field of view of an AID camera or other equipment, as specified;
 - 3. a false alarm rate of less than one false alarm per 10 true alarms; and
 - 4. detecting incidents and providing an alarm to the TCRO in less than 30 seconds
- C. Upon the detection of an incident, the AID system must be capable of recording the video at a rate of at least five frames per second for a period of 60 seconds.

3.16.13 Video Recording

- A. It shall be possible to simultaneously record video from CCTV cameras, as designed, at a rate of at least one frame per second.
- B. Sufficient capacity must be provided to store the recorded video from CCTV cameras for a duration determined by the Concessionaire and continue to record video without intervention.

3.16.14 CCTV Communications Standards

- A. The CCTV communications shall support the appropriate NTCIP 1205 communication protocol (version 1.08 or higher) to provide for functionality with the NRO MPSTOC ATMS software in accordance with the ICD.

3.16.15 Traffic Monitoring Sensors

- A. Traffic monitoring sensors are to be installed to monitor and report in real-time traffic volume, lane occupancy and speed data on the HOT Lanes and, where available, the GP Lanes. Such sensors shall enable the Concessionaire to monitor the performance of the Project as described in the Agreement.
- B. Information collected on the GP Lanes and HOT Lanes will be made available to the Department. Data will be provided in raw form and be subject to quality control requirements prior to submittal to the Department. Data shall be aggregated in increments to be mutually agreed.
- C. Traffic monitoring sensors shall be installed by the Concessionaire approximately every 1/3 mile or as necessary to meet operational requirements. Under unusual circumstances or in specific situations, longer spacing may be used as long as data collection and operational requirements are met. Traffic monitoring sensors shall be installed between interchanges and within interchanges/entry/exit locations where possible.

3.16.16 DMS

- A. The toll and driver information (T&DI) DMS for the HOT Lanes shall be located prior to each entry to the HOT Lanes and will display information to allow drivers to make decisions on whether to use the HOT Lanes. The information to be displayed may indicate:
 - 1. price levels for up to four major destination points for each point of entry;
 - 2. travel-time information for HOT Lanes for up to four major destination points.
- B. Two DMS shall be installed at suitable distances from the HOT Lanes entry points to support motorist decision making and orderly movement of traffic.
- C. The Concessionaire shall coordinate the location of DMS with the Department to avoid over-populating signs and to seek co-gantry opportunities. The Project Roll Plan will identify over-population and potential co-gantry opportunities. The Concessionaire shall incorporate agreed upon recommendations in the final Design Documentation.
- D. The T&DI DMS shall have the following minimum features:

1. full graphics monochrome LED display
 2. capability to display congestion levels on HOT and GP lanes on each tolling section;
 3. capability to display toll price for destination points;
 4. capability to display travel-time information for GP Lanes and HOT Lanes or, alternatively, the travel time difference between GP Lanes and HOT Lanes,
 5. capability to display traffic management information, including warning and recommended diversions;
 6. advanced fault detection and reporting; and
 7. conformance to the National Transportation Communications for ITS Protocol (NTCIP) communications protocol or other industry protocol agreed with the Department.
- E. If communication with the HOT-OC CCCS is lost and the T&DI DMS has no reported errors, the T&DI DMS shall display a user-defined graphic/message.
- F. DMS shall be installed on the HOT Lanes to provide traffic management information to motorists.
- G. The traffic management DMS shall have the following minimum features:
1. full graphics monochrome LED display
 2. capability to display traffic management information, including warning and recommended diversions;
 3. advanced fault detection and reporting; and
 4. conformance to the NTCIP communications protocol or other industry protocol agreed with the Department.
- H. The DMS must not display erroneous information due to a fault with the sign or the loss of pixels.

3.16.17 TMS Availability

- A. An ISA of at least 99.99% is required for the following functions, excluding the effects of any condition beyond the reasonable control of the Concessionaire:

1. calculation of dynamic toll prices and provision of information to other systems/ devices.
- B. All other TMS functions, unless noted otherwise, must have an ISA of at least 99.9%, excluding the effects of any condition beyond the reasonable control of the Concessionaire.
- C. In cases where redundancy is provided, the system must switch between redundant components seamlessly (without impact to operator functionality). The system must also provide the capability to manually switch between redundant devices to support software upgrades/revision and maintenance procedures.

3.16.18 Communications Infrastructure

- A. The existing communications infrastructure must remain in place or be replaced in kind, as specified in the standards and specifications set forth in Attachment 1.5a.
- B. The Department will provide one conduit from its existing infrastructure inventory in, along, or adjacent to the Project, to the extent available, to the Concessionaire for telecommunications fiber installation.
- C. Communication between the ETTM Equipment and the ETTM Facilities shall be via a fully redundant fiber optic network using Spanning Tree Protocol (or equivalent) to ensure no single points of failure and reliability and shall comprise:
 1. a HOT trunk fiber optic loop
 2. local HOT distribution fiber optic loops
 3. redundant switch equipment
- D. The HOT trunk fiber optic loop shall be comprised of new fiber optic cable and fibers from existing Department fiber optic cable subject to availability in accordance to the Agreement.
- E. The local HOT distribution fiber optic loops shall be comprised of new fiber optic cable.
- F. The new communications conduit bank for the Project shall consist of 2 four-inch diameter PVC conduits with the following configuration:
 1. one Concessionaire's spare four inch conduit and one four inch conduit containing a 3-barrel textile inner duct carrying:

2. a 36-fiber HOT trunk cable
 3. a 24-fiber HOT distribution cable
- G. The Concessionaire shall provide and install, for the Department, telecommunications conduit and fiber capacity in, along, or adjacent to the Project where communications infrastructure does not currently exist, consisting of:
1. one four-inch Department conduit with three-barrel textile inner duct, one 48-fiber Department trunk cable, and one 36-fiber Department distribution cable
 2. one four-inch Department spare conduit
- H. The Department's interagency fiber optic network will be used to provide communication between the HOT-OC and 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.
- I. Under the Department's auspices as a part to the multi-agency agreement between the Department and WMATA, the Concessionaire will have access to the fiber optic network as detailed in this Agreement.
- J. Communications cables will be placed in buried conduit, embedded conduit, or structure and bridge-mounted conduit. Conductor cables will be placed in buried conduit, embedded conduit, or structure and bridge-mounted conduit and shall be in separate conduit and related appurtenances.

3.16.19 Existing Department TMS Roadside Equipment

- A. Existing Department TMS roadside equipment or third-party TMS roadside equipment installed under permit with the Department may include the following equipment located within the Project Right of Way:
1. weather stations;
 2. DMS for the existing HOV Lanes and GP Lanes to provide general traffic management and HOV regulatory information;

3. HOV access gates;
 4. ramp meters;
 5. CCTV cameras; and
 6. traffic monitoring sensors.
- B. The Concessionaire shall relocate existing Department TMS roadside equipment located within the Project Right of Way that is affected by construction, including power and communication service to the equipment, and shall ensure that loss of functionality is minimized.
- C. Any third-party TMS roadside equipment located within the Project Right of Way that is affected by construction, including power and communication service to the equipment, shall be relocated by the third-party equipment owner under the direction of the Department at no cost to the Concessionaire. The Concessionaire shall provide notification of disturbance of equipment three weeks prior to commencing such activities.
- D. The Department will remain responsible for the operations and maintenance of the existing and relocated Department TMS roadside equipment. However, during the Operating Period, the Concessionaire shall operate and maintain the access gates and any DMS ties to the access gates.
- E. Third-party equipment owners shall remain responsible for the operation and maintenance of their existing and relocated TMS roadside equipment.

3.16.20 Interface with the NRO MPSTOC ATMS

- A. The interface with the NRO MPSTOC ATMS shall comply with the requirements of the ICD.
- B. TMS shall not effect any change to the NRO MPSTOC ATMS or the procedures for the operation and maintenance of the NRO MPSTOC ATMS unless otherwise required by the provisions of the Technical Requirements and the ICD.
- C. The ETC and TMS shall not cause any unscheduled interruption or adverse effect to the continued functioning of the NRO MPSTOC ATMS or the operations supporting it.
- D. The NRO MPSTOC ATMS shall not cause any unscheduled interruption or adverse effect to the continued functioning of the ETC and TMS or the operations supporting it.

- E. The ETC and TMS shall be capable of being electrically (and, where relevant, optically) and mechanically isolated from the NRO MPSTOC ATMS.
- F. The Concessionaire shall:
 - 1. provide external electronic interfaces between the ETC and TMS and the NRO MPSTOC 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:
 - i. the content of the data to be exchanged;
 - ii. the format of the data to be exchanged;
 - iii. the static data which are required to decipher the meaning of the data exchanged;
 - iv. the bearer protocols to be used;
 - v. any sequencing constraints or assumptions;
 - vi. error handling measures;
 - vii. measures to ensure data integrity;
 - viii. the nature of testing and the associated test data to be used; and
 - ix. any other information necessary for the interface to operate correctly.
- G. The TMS shall have a mechanism to control the rate of transmission of messages/file to the NRO MPSTOC ATMS, with such mechanism being mutually agreed to and in accordance with the ICD.
- H. If the interface to the NRO MPSTOC ATMS is unavailable, the TMS System shall be able to store relevant records for an agreed period of up to five days on secure media and transmit them to the NRO MPSTOC ATMS once the interface is restored.

3.16.21 Data Processing Capacity

- A. The Concessionaire shall ensure that the ETTM System has sufficient data processing capacity.

3.16.22 Alarm Reporting

- A. The ETTM System shall have the capability to monitor 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.

3.16.23 Security

- A. The Concessionaire shall prepare and submit prior to Substantial Completion to the Department a security plan (“Security Plan”) for the HOT 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.
 - 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.
 - 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.

3.16.24 Disaster Recovery

- A. The Concessionaire shall prepare and submit prior to Substantial Completion to the Department a disaster recovery plan (“Disaster Recovery Plan”) for the HOT Lanes operations, which may include the following:
 - 1. mitigating any adverse impact on the ETC system and its operation and/or TMS, in any circumstances where the ability

- of the Concessionaire to provide the operation of the ETTM System would otherwise be impaired; and
2. making provision for action to be taken by the Concessionaire in the event of the unavailability of its premises.
- B. The Disaster Recovery Plan shall identify the measures to be taken in the event of:
1. HOT-OC site loss
 2. Roadside equipment site loss
 3. System data loss or corruption
 4. Systems failure
 5. Failure of the communications link with the NRO MPSTOC ATMS
 6. Failure of the communication links between the roadside equipment and the HOT-OC
 7. Loss of power in the locality
 8. Inability of staff to gain access to, or work effectively at, the HOT-OC facility.

3.16.25 Performance Recording and Reporting

- A. The ETTM System shall incorporate the necessary tools to enable the recording and reporting of performance to meet the requirements under the Agreement.

3.16.26 Testing

- A. The Concessionaire shall submit to the Department a test strategy for the HOT 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 Substantial 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 utilize:
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 utilize 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:
 - i. test specifications for each of the test cycles
 - ii. detailed requirements traceability matrix linking each of the test series to relevant requirement(s)
 - iii. 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.
 5. The testing strategy for the HOT Lanes will provide the level of detail to ensure compliance with the overall testing requirements. This testing strategy shall include:
 - i. System design and integration overview
 - ii. User Acceptance Testing - to ensure that individual functions operate as defined in the requirements specification or similar documents and the complete end-to-end process is tested
 - iii. Factory Acceptance Testing - tests to be conducted at the supplier's premises to verify that the equipment, subsystem or system complies with the functional and performance requirements of that supplier's subcontract

- iv. Site Acceptance Testing - tests to be conducted at the point of installation (tolling point and HOT-OC) to confirm the factory acceptance testing results, plus any omissions and/or errors noted during the factory testing
- v. 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 in normal operating conditions.

3.16.27 Training

The Concessionaire shall develop and conduct a minimum of two information sessions for the Department in the operations and maintenance of the HOT TMS.

- 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 HOT 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 HOT TMS in interface with the NRO MPSTOC and management of incidents.

3.16.28 Standards

- A. The ETTM System shall be designed, implemented, maintained, repaired, and replaced in accordance with all relevant standards and specifications as set forth in Attachment 1.5a.

3.16.29 Department Testing and Integration Obligations

- A. The Department will participate as necessary in the requirements for testing and integration as outlined above where such testing and integration involves the Department's infrastructure. The Concessionaire shall schedule adequate time for notification and testing by the Department.

3.17 Maintenance During Construction

- A. The Concessionaire shall prosecute the Work so as to avoid obstructions to traffic to the greatest extent practicable. The Concessionaire 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 Concessionaire shall maintain the Work from the beginning of construction operations until Final Acceptance.
- C. The Concessionaire 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.
- D. Existing Department Transportation Management System (TMS) devices in the General Purpose Lanes and HOV Lanes shall remain operational during construction unless otherwise approved by the Department. These TMS devices include, but are not limited to: (i) closed-circuit television (CCTV) cameras; (ii) dynamic message signs (DMS); (iii) ramp metering; (iv) detection; (v) mile markers; (vi) the reversible gate system; and (vii) weather stations.
- E. Existing detection (traffic sensors) in the reversible facility shall remain in place during construction activities unless written approval is provided by the Department. Replacement detection shall be installed, operational, integrated, and collecting data before taking existing detection out of service.
- F. 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 Concessionaire'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 Concessionaire significantly impacts the active construction work area, the Concessionaire shall be responsible for that active construction work area until its Final Acceptance. The Concessionaire 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).
- G. The Concessionaire 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 Concessionaire until such time as they are no longer impacted by construction and accepted back by the owning authority.
- H. The Department will operate the gates and maintain assets (components) necessary to operate gates for the existing HOV facility for the duration of the Construction Project.

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- I. Where the Concessionaire's MOT Plan requires traffic to operate on surfaces other than final surface or final alignment, the Concessionaire shall be responsible for maintenance of these roadways, including repair of any damage caused by its operations or use by public traffic.
- J. The existing drainage system will be maintained by the Department until the Concessionaire start impacting the drainage system, at which time all drainage assets within the impacted drainage system will become the Concessionaire's responsibility.
- K. The Department shall maintain all existing HOV lighting within the HOV Lanes. If the highways lights have to be taken out of service within existing HOV facility (only), these lights must be returned to service within 30 days. At no time shall the lights in GP lanes and other roadways be put out of service, unless mutually agreed between the Parties for the purposes of cutover, testing or integration into the ETTM System or NRO MPSTOC ATMS.
- L. The existing lighting and ITS systems will be maintained by the Department until the Concessionaire begins impacting these assets, at which time impacted lighting and impacted ITS assets within the Project limits will become the Concessionaire's responsibility. If there is an existing asset the Concessionaire desires to tie in or connect to, but is prevented from doing so because of physical damage to such existing asset not caused by or attributable to the Concessionaire's activities, the Department shall repair or replace the existing asset in the immediate area of the proposed tie-in or connection so it can perform the proposed tie-in or connection. Any such repair or replacement work shall be completed in accordance with the standards and specifications set forth in Attachment 1.5a. Where the Department desires the Concessionaire to carry out the repair work, the Concessionaire will produce a schedule of work required and agree with the Department on a schedule for carrying out such work as a Department Change. Once the Concessionaire has completed the work, and the work is accepted by the Department, the maintenance activities will revert to the Department's responsibility.
- M. The Department will perform snow and ice removal on all travel ways.
- N. The Concessionaire'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 Concessionaire takes control of the active construction work area.

3.18 As-Built Documents

- A. As a condition to Final Acceptance of the Project, the Concessionaire shall provide to the Department, the record drawings of the Project in accordance with the standards and specifications set forth in Attachment 1.5a, which shall consist of two hard-copy sets, one electronic file of each plan in *.pdf format, one electronic file of each plan in *.tif format, and one electronic file in MicroStation *.dgn format of the final construction plans.
- B. The as-built drawings and documents shall be certified by the Concessionaire to reflect the actual condition of Project at the end of the Work period and organized and indexed to facilitate easy retrieval of information in accordance with the EDMS.

3.19 Surveys

- A. The Concessionaire 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 Concessionaire activities. If a monument is disturbed, or cannot be preserved in place, the Concessionaire shall set the new monument in accordance with the standards referenced set forth in Attachment 1.5a.
- B. All surveying work throughout the term of the Agreement shall be performed by the Concessionaire in accordance with the Department's Survey Manual.
- C. The Concessionaire shall be fully responsible for examination and verification of any data made available by the Department.
- D. Immediately after or within 7 calendar days from receiving the Department's request notice, provided the information exists, the Concessionaire shall make available to the Department hard copy and electronic files of all survey data, for existing and new conditions and infrastructure, which at a minimum include:
 - 1. Survey control data
 - 2. **Digital Terrain Model (DTM) and Construction Cross-Sections:** Compatible to the Department's current DTM format.
 - 3. **Borrow Pits:** All borrow pit DTM's or cross-sections, originals and finals.

4. **Horizontal and Vertical Control for Bridges:** Certified plats, field notes, coordinates, and computations shall be furnished by the Concessionaire prior to the Concessionaire beginning work on these structures.
 5. **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/outlet control, catch basins and manhole and other related infrastructure.
 6. **Road Right of Way:** Existing, newly constructed/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 right of way, and for areas where connecting roads and infrastructure are impacted by the Works. The survey interval shall not be farther than 100-foot intervals. The data prepared by the Concessionaire shall include coordinates, type, size, material and references.
- E. The Project Right of Way shall be staked by the Concessionaire in areas where Work shall occur between the GP Lanes and the limits of the Project Right of Way if no limited access fence is present prior to the start of the Work. Right of Way 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 Concessionaire.
- F. Final right of way monumentation shall be performed by the Concessionaire in accordance with the following:
1. RM-1: The Concessionaire shall furnish and install RM-1 right-of-way monuments in accordance with the Road and Bridge Standards.
 2. RM-2: The Concessionaire shall furnish and install RM-2 right-of-way monuments and optional locator posts, including the required caps, in accordance with the Road and Bridge Standards.
- G. The Department shall determine if an alternative form of permanent monumentation shall be used if RM-1 or RM-2 monuments are unsuitable for marking the right-of-way at various locations.

- H. The Concessionaire shall indicate this alternative monument usage on the final as-built plan in accordance with the Department’s Survey Manual. Electronic data files along with paper sketches and drawings shall be furnished by the Concessionaire. All electronic data files furnished by the Concessionaire shall be in the format of the Department’s current computer hardware and software.
- I. Additional surveying work and supplemental layout work shall be performed by the Concessionaire as needed to successfully complete the work. The Concessionaire shall provide and 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 Concessionaire. All drawings, field notes, and computations from such survey work performed by the Concessionaire shall be submitted to the Department as defined and approved in the Concessionaire’s Project Development Plans.
- J. The Concessionaire shall field-verify all dimensions of the existing noise barriers within the project corridor for the modeling of the existing noise barriers assumptions necessary for the final noise study.

3.20 Security

3.20.1 General Requirements

- A. Subject to the requirements of the Agreement, the Concessionaire shall adhere to the intent of the Department policy on critical infrastructure information and sensitive security information (CII/SSI) to the extent such information is directly related to the Concessionaire’s performance of its obligations under the Agreement. The Concessionaire shall ensure that relevant CII/SSI is protected and not disclosed to unauthorized persons. The Concessionaire shall ensure that all personnel having access to CII/SSI for the Concessionaire and all subcontractors have met the requirements of IIM-LD-236 Critical Infrastructure (CII) / Sensitive Security Information (SSI).
- B. The Department may request fingerprint-based criminal history background checks on contractors working on specific structures or functions.
- C. The Concessionaire shall review with the Department any information that should be designated as CII/SSI as specific design details become available. Any requirements for security review or other inspections will be mutually agreed to with the Department.

3.20.2 Concessionaire’s Responsibility During Suspension of Construction

- A. In case of suspension of construction Work, the Concessionaire 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 Concessionaire shall properly and continuously maintain in acceptable growing condition all living material in newly established plantings, seeding, and soddings 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.

3.20.3 Security Requirements for Concessionaire Operated Critical Infrastructure Facilities and Structures

- A. The Department and the Concessionaire will mutually agree during the Construction Period to the requirements of the Security Management Systems (SMS) and protocols for the Express Operations Center as described in Attachment 1.10.
- B. All costs and funding associated with these requirements and protocols will be mutually agreed between the Department and the Concessionaire.

3.21 Railway-Highway Provisions

If the Concessionaire’s Work requires hauling materials across the tracks of a railway, the Concessionaire shall make arrangements with the railway for any new crossing(s) required or the use of any existing crossing. Charges made by the railway company, including but not limited to: 1) for the construction or use of new or existing crossings and their subsequent removal; 2) for watchperson or flagger service at such crossings; 3) insurance, submittal review and other necessary costs deemed by railway company, shall be reimbursed by the Concessionaire directly to the railway company under the terms of their own arrangements before Final Acceptance.

Work to be performed by the Concessionaire in construction on or over the railway right of way shall be performed at times and in a manner that will not interfere unnecessarily with the movement of trains or traffic on the railway track. The Concessionaire shall use care to avoid accidents, damage, or unnecessary delay or interference with the railway company’s trains or other property. If any interruption of railway traffic is required by the Concessionaire’s actions, it shall obtain prior written approval from the railway company.

The Concessionaire shall conduct operations that occur on or over the right of way of any railway company fully within the rules, regulations, and requirements of the railway company and in accordance with the requirements of any agreements made between the Department and railway company that are made a part of the Agreement.

- A. **Flagger or Watchperson Services:** Flagger or watchperson services required by the railway company for the safety of railroad operations because of work being performed by the Concessionaire or incidental thereto will be provided by the railway company. The cost for such services will be borne by the Concessionaire.

No work shall be undertaken on or over the railway right of way until the watchpersons or flaggers are present at the project site. The Concessionaire shall continuously prosecute the affected work to completion to minimize the need for flagger or watchperson services.

- B. **Approval of Construction Methods on Railway Right of Way:** The Concessionaire shall submit to the Department a plan of operations showing the design and method of proposed structural operations and shall provide the Department a copy of railway company's approval before performing any work on the railway company's right of way unless otherwise indicated in the railroad agreement. The plan shall be clear and legible, and details shall be drawn to scale. The plan shall show, but not be limited to, the following:

1. proximity of construction operations to tracks
2. depth of excavation with respect to tracks
3. description of structural units
4. vertical and horizontal clearances to be afforded the railroad during installation and upon completion of excavation
5. sheeting and bracing
6. method and sequence of operations

Any review of or comment on the plan of operations by the Department shall not relieve the Concessionaire of any liability under the Agreement. The Concessionaire shall arrange the work so as not to interfere with the railway company's operation except by agreement with the railway company.

- C. **Insurance:** In addition to insurance or bonds required under the terms of the Agreement, the Concessionaire shall cause the Design-Build Contractor to carry insurance covering operations affecting the property of the railway company. The original railroad protective

liability insurance policy and certificate of insurance showing insurance carried by the Design-Build Contractor and any subcontractor shall be submitted to the railway company for retention.

Neither the Design-Build Contractor nor any subcontractor shall begin any work affecting the railway company until the railway company has received the insurance.

Notice of any material change in or cancellation of the required policies shall be furnished to the Department and the railway company at least 30 days prior to the effective date of the change or cancellation. The insurance shall be of the following kinds and amounts:

1. **Concessionaire's public liability and property damage insurance:** The Concessionaire shall furnish evidence to the Department with respect to the operations to be performed that it carries regular Concessionaire's public liability insurance. The insurance shall provide for a limit of at least the dollar value specified in the Agreement for all damages arising out of bodily injuries to or the death of one person, and subject to that limit for each person, a total limit of at least the dollar value specified in the Agreement for all damages arising out of bodily injuries to or death of two or more persons in any one occurrence, and regular Concessionaire's property damage insurance providing for a limit of at least the dollar value specified in the Agreement for all damages arising out of bodily injury to or destruction of property in any one occurrence, and subject to that limit per occurrence, a total or aggregate limit of at least the dollar value specified in the Agreement for all damages arising out of injury to or destruction of property during the policy period. The Concessionaire's public liability and property damage insurance shall include explosion, collapse, and underground damage coverage. If the Concessionaire subcontracts any portion of the work, it shall secure insurance protection in its own behalf under the Agreement's public liability and property damage insurance policies to cover any liability imposed on it by law for damages because of bodily injury to, or death of persons and injury to, or destruction of property as a result of work undertaken by the Subcontractor. In addition, the Concessionaire shall provide similar insurance protection for and on behalf of any Subcontractors to cover their operation by means of separate and individual Concessionaire's public liability and property damage policies. As an alternative, the Concessionaire shall require each Subcontractor to provide such insurance in its own behalf.

2. **Railroad protective insurance and public liability and property damage:** The policy furnished the railway company shall include coverage for contamination, pollution, explosion, collapse, and underground damage. The policy shall be of the type specified hereinafter and shall be expressed in standard language that may not be amended. No part may be omitted except as indicated hereinafter or by an endorsement that states an amendment or exclusion of some provision of the form in accordance with the provisions of a manual rule. The form of the endorsement shall be approved as may be required by the supervising authority of the state in which the policy is issued. Several parts of the requirements and stipulations specified or inferred herein may appear in the policy in such sequence as the company may elect.

- i. For a policy issued by one company:

(NAME AND LOCATION OF INDEMNITY COMPANY), a _____ Insurance Company, herein called the (Type of Company) Company, agrees with the insured named in the Declarations made a part hereof, in consideration of the payment of the premium and in reliance upon the statements in the Declarations made by the named insured and subject to all of the terms of his policy.

For a policy issued by two companies:

(NAME AND LOCATION OF INDEMNITY COMPANY) and (NAME AND LOCATION OF INDEMNITY COMPANY), each a _____ Insurance Company, herein called (Type of Company) the Company, severally agree with the insured named in the Declarations made a part hereof, in consideration of the payment of the premium and in reliance upon the statements in the Declaration made by the named insured and subject to all of the terms of this policy, provided the named Indemnity Company shall be the insured with respect to Coverage _____ and no other and the named Insurance Company shall be the insurer with respect to Coverage _____ and no other.

- ii. Insuring agreements:

- a. **Coverages: Coverage A—Bodily injury liability:** To pay on behalf of the insured all sums that the insured shall become legally obligated to pay as damages because of bodily injury, sickness, or disease including death at any time resulting therefrom (hereinafter called bodily injury) either (1) sustained by any person arising out of acts or omissions at the designated job site that are related to or are in connection with the work described in Item (vi) of the Declarations; or (2) sustained at the designated job site by the Concessionaire, any employee of the Concessionaire, any employee of the governmental authority specified in Item (v) of the Declarations, or any designated employee of the insured, whether or not arising out of such acts or omissions.

Coverage B—Property damage liability: To pay on behalf of the insured all sums the insured shall become legally obligated to pay as damages because of physical injury to or destruction of property, including loss of use of any property because of such injury or destruction (hereinafter called property damage) arising out of acts or omissions at the designated job site that are related to or are in connection with the work described in Item (vi) of the Declarations.

Coverage C—Physical damage to property: To pay for direct and accidental loss of or damage to rolling stock and other contents, mechanical construction equipment, or motive power equipment (hereinafter called loss) arising out of acts or omissions at the designated job site that are related to or are in connection with the work described in Item (vi) of the Declarations; provided such property is owned by the named insured or is leased or entrusted to the named insured under a lease or trust agreement.

- b. **Definitions:** *Insured* includes the named insured and any executive officer, director, or stockholder thereof while acting within the scope of his duties as such.

Concessionaire means the Concessionaire designated in Item (iv) of the Declarations and includes all Subcontractors of the Concessionaire but not the named insured.

Designated employee of the insured means (1) any supervisory employee of the insured at the job site; (2) any employee of the insured while operating, attached to, or engaged on work trains or other railroad equipment at the job site that is assigned exclusively to the Concessionaire; or (3) any employee of the insured not within (1) or (2) who is specifically loaned or assigned to the work of the Concessionaire for prevention of accidents or protection of property, the cost of whose services is borne specifically by the Concessionaire or governmental authority.

Contract means any contract or agreement to carry a person or property for a consideration or any lease, trust, or interchange contract or agreement respecting motive power, rolling stock, or mechanical construction equipment.

- c. **Defense and settlement supplementary payments:** With respect to such insurance as is afforded by this policy under Coverages A and B, the Company shall defend any suit against the insured alleging such bodily injury or property damage and seeking damages that are payable under the terms of this policy, even if any of the allegations of the suit are groundless, false, or fraudulent. However, the Company may make such investigation and settlement of any claim or suit as it deems expedient.

In addition to the applicable limits of liability, the Company shall pay (1) all expenses incurred by the company, all costs taxed against the insured in any such suit, and all interest on the entire amount of any judgment therein that accrues after entry of the judgment and before the Company has paid or tendered or deposited in court that part of the judgment that does not exceed the limit of the Company's liability thereon; (2) premiums on appeal bonds required

in any such suit and premiums on bonds to release attachments for an amount not in excess of the applicable limit of liability of this policy, but without obligation to apply for or furnish any such bonds; (3) expenses incurred by the insured for first aid to others that shall be imperative at the time of the occurrence; and (4) all reasonable expenses, other than loss of earnings, incurred by the insured at the Company's request.

- d. **Policy period and territory:** This policy applies only to occurrences and losses during the policy period and within the United States, its territories or possessions, or Canada.
- iii. **Exclusions:** This policy does not apply to the following:
- a. liability assumed by the insured under any contract or agreement except a contract as defined herein
 - b. bodily injury or property damage caused intentionally by or at the direction of the insured
 - c. bodily injury, property damage, or loss that occurs after notification to the named insured of the acceptance of the work by the governmental authority, other than bodily injury, property damage, or loss resulting from the existence or removal of tools, uninstalled equipment, and abandoned or unused materials
 - d. under Coverage A(1), B, and C, to bodily injury, property damage, or loss, the sole proximate cause of which is an act or omission of any insured
 - e. under Coverage A, to any obligation for which the insured or any carrier as his insurer may be held liable under any workers' compensation, employment compensation, or disability benefits law or under any similar law; provided that the Federal Employer's Liability Act, *U.S. Code* (1946) Title 45, Sections 51-60, as

amended, shall for the purpose of this insurance be deemed not to be any similar law

- f. under Coverage B, to injury to or destruction of property owned by the named insured or leased or entrusted to the named insured under a lease or trust agreement
- g. under any liability coverage, to injury, sickness, disease, death, or destruction (1) with respect to which an insured under the policy is also an insured under a nuclear energy liability policy issued by the Nuclear Energy Liability Insurance Association, Mutual Atomic Energy Liability Underwriters, or Nuclear Insurance Association of Canada or would be an insured under any such policy but for its termination upon exhaustion of its limit of liability; or (2) resulting from the hazardous properties of nuclear material and with respect to which any person or organization is required to maintain financial protection pursuant to the Atomic Energy Act of 1954 or any law amendatory thereof or the insured is (or had this policy not been issued would be) entitled to indemnity from the United States or any agency thereof under any agreement entered into by the United States, or any agency thereof, with any person or organization
- h. under any Medical Payments Coverage or any Supplementary Payments provision relating to immediate medical or surgical relief or to expenses incurred with respect to bodily injury, sickness, disease, or death resulting from the hazardous properties of nuclear material and arising out of the operation of a nuclear facility by any person or organization
- i. under any liability coverage, to injury, sickness, disease, death, or destruction resulting from the hazardous properties of nuclear material if (1) the nuclear material is at any nuclear facility owned or operated by or on behalf of an insured or has been discharged or dispersed therefrom; (2) the nuclear material is contained in spent fuel or waste at any time possessed, handled,

used, processed, stored, transported, or disposed of by or on behalf of an insured; or (3) the injury, sickness, disease, death, or destruction arises out of the furnishing by an insured of services, materials, or parts for equipment in connection with the planning, construction, maintenance, operation, or use of any nuclear facility; if such facility is located in the United States, its territories or possessions, or Canada, this exclusion applies only to injury to or destruction of property at such nuclear facility

- j. under Coverage C, to loss attributable to nuclear reaction, nuclear radiation, or radioactive contamination or to any act or condition incident to any of the foregoing

As used in exclusions (g), (h), and (i), the following definitions apply: *Hazardous properties* include radioactive, toxic, or explosive properties. *Nuclear material* means source material, special nuclear material, or byproduct material. *Source material, special nuclear material, and byproduct material* have the meanings given them in the Atomic Energy Act of 1954 or in any law amendatory thereof. *Spent fuel* means any fuel element or fuel component (solid or liquid) that has been used or exposed to radiation in a nuclear reaction. *Disposable material* means material containing byproduct material and resulting from the operation by any person or organization of any nuclear facility included in the definition of nuclear facility under (a) or (b) below. *Nuclear facility* means

- a. any nuclear reactor
- b. any equipment or device designed or used for separating the isotopes of uranium or plutonium; processing or utilizing spent fuel; or handling, processing, or packaging waste
- c. any equipment or device designed or used for the processing, fabricating, or alloying of special nuclear material if at any time the total amount of such material in the custody of the insured at the premises where such equipment or device is located consists of or contains more than 25 grams of plutonium or uranium 233 (or

any combination thereof) or more than 250 grams of uranium 235

- d. any structure, basin, excavation, premises, or place prepared or used for the storage or disposal of waste (includes the site on which any of the foregoing is located, all operation conducted on such site, and all premises used for such operations) *Nuclear reactor* means any apparatus designed or used to sustain nuclear fission in a self-supporting chain reaction or to contain a critical mass of fissionable material. With respect to injury to or destruction of property, *injury* or *destruction* includes all forms of radioactive contamination of property.

- iv. **Conditions:** The following conditions, except conditions (c) through (l), apply to all coverages. Conditions (c) through (l) apply only to the coverage noted thereunder.

- a. **Premium:** The premium bases and rates for the hazards described in the Declarations are stated therein. Premium bases and rates for hazards not so described are those applicable in accordance with the requirements of the manuals used by the company. The term *contract cost* means the total cost of all work described in Item (vi) of the Declaration. The term *rental cost* means the total cost to the Concessionaire for rental or work trains or other railroad equipment, including the remuneration of all employees of the insured while operating, attached to, or engaged thereon. The advance premium stated in the Declarations is an estimated premium only. Upon termination of this policy, the earned premium shall be computed in accordance with the Company's rules, rates, rating plans, premiums, and minimum premiums applicable to this insurance. If the earned premium thus computed exceeds the estimated advance premium paid, the Company shall look to the Concessionaire specified in the Declarations for any such excess. If less, the Company shall return to the Concessionaire the unearned

portion paid. In no event shall payment or premium be an obligation of the named insured.

- b. **Inspection:** The named insured shall make available to the Company records of information relating to the subject matter of this insurance. The Company shall be permitted to inspect all operations in connection with the work described in Item (vi) of the Declarations.
- c. **Limits of liability, Coverage A:** The limit of bodily injury liability stated in the Declarations as applicable to "each person" is the limit of the Company's liability for all damages (including damages for care and loss of services) arising out of bodily injury sustained by one person as the result of any one occurrence. The limit of such liability stated in the Declarations as applicable to "each occurrence" is (subject to the provision respecting each person) the total limit of the Company's liability for all such damage arising out of bodily injury sustained by two or more persons as the result of any one occurrence.
- d. **Limits of liability, Coverages B and C:** The limit of liability under Coverages B and C stated in the Declarations as applicable to "each occurrence" is the total limit of the Company's liability for all damages and all loss under Coverages B and C combined arising out of physical injury to, destruction of, or loss of all property of one or more persons or organizations, including the loss or use of any property attributable to such injury or destruction under Coverage B, as the result of any one occurrence. Subject to the provision respecting "each occurrence", the limit of liability under Coverages B and C stated in the declaration as "aggregate" is the total limit of the Company's liability for all damages and all loss under Coverages B and C combined arising out of physical injury to, destruction of, or loss of property, including the loss or use of any property attributable to such injury or destruction under Coverage B.

Under Coverage C, the limit of the Company's liability for loss shall not exceed the actual cash value of the property, or if the loss is a part thereof, the actual cash value of such part, at time of loss, nor what it would then cost to repair or replace the property of such part thereof with other of like kind and quality.

- e. **Severability of interests, Coverages A and B:** The term *the insured* is used severally and not collectively. However, inclusion herein of more than one insured shall not operate to increase the limits of the Company's liability.
- f. **Notice:** In the event of an occurrence or loss, written notice containing particulars sufficient to identify the insured and also reasonably obtainable information with respect to the time, place, and circumstances thereof and the names and addresses of the injured and of able witnesses shall be given by or for the insured to the company or any of its authorized agents as soon as is practicable. If a claim is made or a suit is brought against the insured, he shall immediately forward to the Company every demand, notice, summons, or other process received by him or his representative.
- g. **Assistance and cooperation of the insured, Coverages A and B:** The insured shall cooperate with the Company and upon the Company's request attend hearings and trials and assist in making settlements, securing and giving evidence, obtaining the attendance of witnesses, and conducting suits. Except at his own cost, the insured shall not voluntarily make any payment, assume any obligations, or incur any expense other than for first aid to others that shall be imperative at the time of an accident.
- h. **Action against Company, Coverages A and B:** No action shall lie against the Company unless as a condition precedent thereto the insured shall have fully complied with all the terms of this policy, nor until the amount of the insured's obligation to pay shall have been finally determined either by judgment against

the insured after actual trial or by written agreement of the insured, the claimant, and the Company. Any person or organization or the legal representative thereof who has secured such judgment or written agreement shall thereafter be entitled to recover under this policy to the extent of the insurance afforded by this policy. No person or organization shall have any right under this policy to join the Company as a part to any action against the insured to determine the insured's liability. Bankruptcy or insolvency of the insured or of the insured's estate shall not relieve the Company of any of its obligations hereunder.

- i. **Action against Company, Coverage C:** No action shall lie against the Company unless as a condition precedent thereto there shall have been full compliance with all the terms of this policy nor until 30 days after proof of loss is filed and the amount of loss is determined as provided in this policy.
- j. **Insured's duties in event of loss, Coverage C:** In the event of loss, the insured shall protect the property, whether or not the loss is covered by this policy. Any further loss attributable to the insured's failure to protect shall not be recoverable under this policy. Reasonable expenses incurred in affording such protection shall be deemed incurred at the company's request.

The insured shall also file with the Company, as soon as practicable after loss, his sworn proof of loss in such form and including such information as the Company may reasonably require and shall, upon the Company's request, exhibit the damaged property.

- k. **Appraisal, Coverage C:** If the insured and the Company fail to agree as to the amount of loss, either may demand an appraisal of the loss within 60 days after the proof of loss is filed. In such event the insured and the Company shall each select a competent appraiser, and the appraisers shall select a competent and

disinterested umpire. An award in writing or any two shall determine the amount of loss. The insured and the Company shall each pay his chosen appraiser and shall bear equally the other expenses of the appraisal and umpire. The Company shall not be held to have waived any of its rights by any act relating to appraisal.

- l. **Payment of loss, Coverage C:** The Company may pay for the loss in money, but there shall be no abandonment of the damaged property to the Company.
- m. **No benefit to bailee coverage:** The insurance afforded by this policy shall not enure directly or indirectly to the benefit of any carrier or bailee (other than the named insured) liable for loss to the property.
- n. **Subrogation:** In the event of any payment under this policy, the Company shall be subrogated to all of the insured's rights of recovery therefore against any person or organization. The insured shall execute and deliver instruments and papers and do whatever else is necessary to secure such rights. The insured shall do nothing after loss to prejudice such rights.
- o. **Application of insurance:** The insurance afforded by this policy is primary insurance. If the insured has other primary insurance against a loss covered by this policy, the Company shall not be liable under the policy for a greater proportion of such loss than the applicable limit of liability stated in the Contract bears to the total applicable limit of all valid and equitable insurance against such loss.
- p. **3-year policy:** A policy period of 3 years is comprised of three consecutive annual periods. Computation and adjustment of earned premium shall be made at the end of each annual period. Aggregate limits of liability as stated in this policy shall apply separately to each annual period.

- q. **Changes:** Notice to any agent of knowledge possessed by any agent or by any other person shall not affect a waiver or a change in any part of this policy or stop the Company from asserting any right under the terms except by endorsement issued to form a part of this policy signed by *_____ provided, however, changes may be made in the written portion of the declaration by *_____ when initialed by such *_____ or by endorsement issued to form a part of this policy signed by such *_____. [*Insert titles of authorized company representatives.]
- r. **Assignment:** Assignment of interest under this policy shall not bind the Company until its consent is endorsed hereon.
- s. **Cancellation:** This policy may be cancelled by the named insured by mailing to the Company written notice stating when the cancellation shall become effective. This policy may be cancelled by the Company by mailing to the named insured, Concessionaire, and governmental authority at the respective addresses shown in this policy written notice stating when such cancellation shall be effective (not less than 30 days thereafter). The mailing of notice shall be sufficient proof of notice. The effective date and hour of cancellation stated in the notice shall become the end of the policy period. Delivery of such written notice either by the named insured or the Company shall be equivalent to mailing. If the named insured cancels, the earned premium shall be computed in accordance with the customary short rate table and procedure. If the Company cancels, the earned premium shall be computed pro rata. The premium may be adjusted either at the time cancellation is effected or as soon as practicable after the cancellation becomes effective, but payment or tender of unearned premium is not a condition of cancellation.
- t. **Declarations:** By acceptance of this policy, the named insured agrees that such statements in the

Declarations as are made by him are his agreements and representations, that his policy is issued in reliance on the truth of such representations, and that this policy embodies all agreements existing between himself and the Company or any of its agents relating to this insurance.

- v. For a policy issued by one company:

In witness whereof, the _____ Indemnity Company has caused this policy to be signed by its president and a secretary at _____ and countersigned on the Declarations page by a duly authorized agent of the Company.

(Facsimile of Signature)
Secretary

(Facsimile of Signature)
President

For a policy issued by two companies:

In witness whereof, the _____ Indemnity Company has caused this policy with respect to Coverages _____ and such other parts of the policy as are applicable thereto to be signed by its president and a secretary at _____ and countersigned on the Declarations page by a duly authorized agent of the Company.

(Facsimile of Signature)
Secretary

(Facsimile of Signature)
President

- vi. **Submitting Copies of Insurance Policies:** Prior to beginning construction operations on or over the railway right of way, the Concessionaire shall submit to the Department evidence of the railway company's approval and a copy of the required insurance policies. The State shall not be responsible for any claims from the Concessionaire resulting from delay in the acceptance of any of these policies by the railway company other than consideration of an extension of time. If the delay is caused by the failure of the Concessionaire or his insurer to file the required insurance policies promptly, an extension of time will not be granted.

- vii. **Beginning Construction:** Preliminary contingent work or other work by the railway company may delay the starting or continuous prosecution of the work by the Concessionaire. The Concessionaire shall be satisfied as to the probable extent of such work and its effect on the operations prior to submitting a Proposal. The State shall not be responsible for any claims by the Concessionaire resulting from such delays except that an extension of time may be considered.
- viii. Arranging for Tests:
 - a. **Railroad specifications:** When ordering materials that are to conform to railroad specifications, the Concessionaire shall notify the railway company, who will arrange for tests. The Concessionaire shall specify in each order that the materials are to be tested in accordance with the requirements of the railroad specifications and not those of the Department.
 - b. **Highway specifications:** When ordering materials that are to conform to Standard Specifications, the Concessionaire shall specify in each order that the materials are to be tested in accordance with the Standard Specifications.

3.22 Railroad Design

- A. The Concessionaire 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 right of way, such as a frontage road. Designs impacting on NS or other railway right of way 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.
- B. The Concessionaire shall coordinate directly with the railroads impacted by the Project. The Concessionaire 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, Georgia 30309

4 Operations, Maintenance, and Tolling for the HOT Lanes

4.1 General

- A. The Concessionaire shall operate and maintain the Project assets including the ETTM System and ETTM Facilities for the duration of the Operating Period in a manner consistent with the Agreement.
- B. The Concessionaire shall operate and maintain the Project gate system in a manner intended to disallow traffic from entering in the opposite direction of the current traffic flow, excluding any condition beyond the control of the Concessionaire.
- C. The Concessionaire shall implement an effective operations management framework which may include, among other things: traffic management, monitoring, control and enforcement, facility management and administration, and tolling administration, operations, enforcement, and collection.
- D. The Concessionaire shall implement an effective Maintenance Management System which may include, among other things, to record inventory, failures, repairs, maintenance activities, inspections performed, and defects.
- E. The Concessionaire shall meet all operations, maintenance, and tolling Performance Requirements in accordance with the Agreement.
- F. The Concessionaire will 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 Concessionaire shall engage or employ or shall 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 Concessionaire'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 HOT Lanes;
 6. monitor the effects of extreme weather conditions; and
 7. collate data to monitor performance of the HOT Lanes and to establish priorities for future maintenance operations.
- B. The Concessionaire shall require personnel performing inspections of road pavements to be certified as inspectors in accordance with standards and specifications set forth in Attachment 1.5a.
- C. All structures shall be inspected by the Department in accordance with the National Bridge Inspection Standards (NBIS) of the *Code of Federal Regulations, 23 Highways – Part 650* and Department requirements. The Department shall furnish copies of all inspection reports within four (4) weeks of completion of the inspection, unless otherwise mutually agreed.
- D. Defects that are subject to the Performance Requirements and the Timeliness Requirements require prompt attention if the Concessionaire determines that they represent an imminent hazard, or there is a risk of imminent structural deterioration, or there is an imminent risk of damage to a third party's property or equipment, or there is an imminent risk of damage to the environment, all to the extent that the Concessionaire can control.

4.2.2 Inspection Frequency

- A. The Concessionaire 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 scales set out in the Performance Requirements;

2. all defects that present a hazard are identified, documented and remedied within the time scales set out in the Performance Requirements; and
 3. all other defects are identified, documented, and repaired within the time scales 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 Concessionaire.
- C. The Concessionaire shall investigate reports and complaints on the condition of the HOT Lanes received from all sources. The Concessionaire shall record these as O&M records, together with details of all relevant inspections and actions taken in respect of 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 Concessionaire shall at a minimum conform to the inspection standards set forth in Attachment 1.5a.

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 Concessionaire 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.

4.3 Maintenance Requirements

4.3.1 General Obligations

- A. The Concessionaire shall, or shall cause the O&M Contractor to, maintain the HOT Lanes and shall take all necessary action to perform the following:
1. maintain the HOT Lanes pursuant to the Agreement, including Good Industry Practice;
 2. minimize traffic delay to drivers;

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3. respond to all incidents and defects as quickly as possible 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 HOT Lanes as will enable them to minimize any associated adverse consequences;
 5. protect the safety of users, workers, or other persons on the HOT Lanes or other portions of the Project Right of Way used for HOT 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 Right of Way;
 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 HOT Lanes to perform those duties and functions through agreed protocols; and
 9. perform inspections in accordance with the Agreement.
- B. The Concessionaire shall maintain the bridges identified in accordance with the Agreement and Attachment 4.3.
- C. The Department shall maintain the GP Lanes (including structures and overpasses that carry only general purpose traffic and related infrastructure).
- D. The Department shall maintain HOT lane slip ramps that carry traffic to or from the HOT Lanes to the GP Lanes and flyover ramps that carry traffic to or from the HOT lanes.
- E. The Concessionaire shall maintain the direct connect ramp to or from the Franconia-Springfield Parkway.
- F. In accordance with the Agreement, the Department shall maintain Department Shared Assets, except as noted in subsection (G) below, which may include, but are not limited to, the following:
1. structures (bridges carrying both HOT Lanes and general purpose traffic are identified in Attachment 4.3);
 2. drainage that conveys or stores storm water from both HOT Lanes and GP Lanes (the limits of maintenance shall extend to

- the ultimate outfall and associated maintenance requirements at the outfall);
3. drainage (e.g., pipes, box culverts, etc.) that convey water under both the HOT Lanes and GP Lanes;
 4. lighting;
 5. signage;
 6. signalization;
 7. concrete barrier and guardrail;
 8. fences;
 9. retaining walls;
 10. ITS conduit;
 11. glare screens; and
 12. impact attenuators.
- G. For all bridges carrying HOT Lanes, the Concessionaire shall perform all activities necessary to fulfill the Ordinary Maintenance Performance Requirements on bridge deck assets in accordance with the Performance Requirements.

4.3.2 O&M Data Management

- A. Prior to Substantial Completion, the Concessionaire shall implement a computer-based Maintenance Management System (MMS), which may be comprised of multiple systems and/or tools, to record inventory, failures, repairs, maintenance activities, inspections performed, communications, and notifications of incidents and defects. The Concessionaire shall enter all of the assets into the MMS with Asset identifications (IDs) as determined by the Concessionaire 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 may include, among other things, 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 three days of them coming to the attention of the Concessionaire or action being taken. All other recording requirements shall be recorded on the MMS within 15 days of completion or occurrence of the relevant activity.
- D. The Concessionaire 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 Concessionaire shall provide the Department access to the MMS at all times for the purposes of auditing the accuracy of the Concessionaire'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 and/or maintenance activities.
- F. The MMS shall be kept updated and operational throughout the Operating Period.

4.4 Operations Requirements

4.4.1 General Obligations

- A. The Concessionaire shall be responsible for, or shall cause the O&M Contractor to be responsible for, in accordance with the Agreement, 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 HOT Lanes
 3. monitoring the condition and operational performance of the HOT 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 the Department's Traffic Operations Center
 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 HOT Lanes
- B. The Concessionaire shall monitor and observe weather and weather forecasts and deploy resources to minimize delays and safety hazards due to severe weather events, to the extent practical. The Department shall coordinate with the Concessionaire and deploy resources to minimize delays and safety hazards due to snow and/or ice events, in accordance with the Agreement.
- C. The Concessionaire will respond within seven days to customer inquiries and complaints about the HOT Lanes where contact details of customers have been provided no matter whether the complaint is received directly from customers, the customer service center, or from the Department.

4.4.2 Data Collection

- A. A process of data collection will be established that includes, at a minimum, traffic data (i.e., 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 Concessionaire's control. In such instances the Concessionaire will endeavor to remedy the issue in accordance with normal business practices.
- C. The Concessionaire shall store all data and make the data accessible to the Department in accordance with the Agreement.

4.4.3 Data Compiling and Reporting

- A. The Concessionaire 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 Concessionaire 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 northern and southern 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 HOT lanes at each Mainline sensor station 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 HOT 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.
 - 3. Documentation of any periods that were impacted by incidents or activities outside of the control of the Concessionaire 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 HOT Lane Mainline sensor Station.
- 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) and the Federal Degradation Standard, 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:

$$\text{Percent Degradation} = \left[\frac{\sum_1^{180} \text{Substandard Stations}}{(\text{Stations} \times 180 \text{ Days})} \right] \times 100$$

- (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 (8) different values being calculated for each reporting cycle for the whole HOT Lanes facility. Each value is based on the Reporting Segments in accordance with the Agreement. This is made up of at least four (4) different values for the Federal Degradation Standard (i.e. two AM NB, two PM SB) and at least four (4) different values for OSPS (i.e. two AM NB, two PM SB).

4.4.5 Federal Degradation Standard

- 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. For the avoidance of doubt, the Concessionaire 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:

(2) Degraded Facility.--

(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. The facility is considered degraded by the Federal Degradation Standard when compliance is less than or equal to 90 percent, where:
 - a. The minimum average operating speed for the Federal Degradation Standard is less than 45 MPH.
 - b. Compliance means: 100 Percent – Percent Degradation is greater than or equal to 90 percent
 - c. Percent Degradation will be calculated for weekday Peak Periods for the Mainline HOT Lanes Reporting Segments.

4.4.6 Operating Speed Performance Standard

- A. The Concessionaire shall meet or exceed the Operating Speed Performance Standard (OSPS). The OSPS is in addition to the federal requirement that the HOT Lanes are not a degraded facility.
- B. The Concessionaire shall provide a minimum average operating speed of 55 MPH on the Mainline HOT 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

HOT 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 Concessionaire.
 4. Force Majeure Events.
- D. The Facility is considered degraded by the OSPS Standard when Compliance is less than or equal to 90 percent, where:
1. The minimum average operating speed is less than 55 MPH.
 2. Compliance means: 100 percent – Percent Degradation is greater than or equal to 90 percent
 3. Percent Degradation will be calculated for weekday Peak Periods for the Mainline HOT Lanes Reporting Segments
- E. The impact of the Concessionaire'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 Concessionaire shall provide equipment and personnel to support incident and emergency management operations on the HOT Lanes in accordance with the Operations and Maintenance Plan. The Concessionaire 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. In the event of an Incident, the Concessionaire 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.
- C. The Concessionaire 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.

- D. Where structural damage to a HOT Lane 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/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.
- E. The Concessionaire shall not reopen any area of the HOT 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.
- F. The Concessionaire shall ensure that procedures are in place for public/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.
- G. The Concessionaire 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 communicated to the Department within five minutes of the Concessionaire determining the incident classification, in accordance with the Operations and Maintenance Plan.

4.4.9 Driver Information (HOT Lanes)

- A. The Concessionaire shall utilize 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 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 Concessionaire. The ISA for traffic management DMS shall be at least 99.9% excluding the effects of any condition beyond the reasonable control of the Concessionaire.

4.4.10 Emergency Evacuation

- A. The Project is designated as an emergency evacuation route for the Washington Metropolitan Area. The Concessionaire 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 Concessionaire 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 Concessionaire 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 Concessionaire 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 others agencies/organizations. The Concessionaire shall send a representative to participate throughout the Operating Period in any annual statewide coordination meetings for evacuation and emergency services held during the year.

4.4.11 Waste Disposal and Use of Hazardous Substances

The Concessionaire 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 Right of Way during the Term, in each case in accordance with applicable regulatory requirements, Good Industry Practice, the Agreement and the Environmental Management Plan in Attachment 1.3.

4.5 Performance Requirements

- A. 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.
- B. The Asset Condition Performance Requirements are set out in Table 4.5a in Attachment 4.5.
- C. 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.

- D. The Concessionaire 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 quarterly O&M report in a format to be agreed between the Concessionaire and the Department prior to Substantial Completion. Performance also shall be summarized in an end-of-year report, as outlined in the Agreement.
- E. The Concessionaire 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.
- F. Where the Concessionaire fails to meet the Performance Requirements, Non-Compliance Points may be assessed pursuant to the Agreement.
- G. The Concessionaire shall update the Ordinary Maintenance Performance Requirements 90 days before Substantial Completion to reflect current industry practices and changes as mutually agreed by the Department, consistent with the Northern Virginia TAMS criteria in place on similar highways in Northern Virginia. The Department shall approve the updated tables 30 days before the Substantial Completion Date and then 30 days before every subsequent update.
- H. 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.
- I. The Project shall be subject to the Department's Maintenance Rating Program (MRP), or subsequent updated or replacement program. The Concessionaire shall use the MRP to verify performance of each Asset against the criteria set out in the Performance Requirements. The Concessionaire 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 Concessionaire and the Department.

4.6 Maintenance and Handback Requirements

4.6.1 Maintenance and Life Cycle Maintenance Plan

- A. The Concessionaire shall perform maintenance in accordance with Attachments 4.6a Maintenance Responsibility Matrix and Attachment 4.6b Maintenance Responsibility Plans and when necessary 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 as shown in Attachment 4.6c. 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 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 Concessionaire's approach to the management, operations and maintenance of the facility so that the Department can ensure a smooth transition from Concessionaire to the Department at the end of the Operating Period.
- B. The Transition Plan shall include a checklist of relevant activities in sufficient detail for a smooth transition from Concessionaire operations to Department operations.
- C. The Transition Plan shall be delivered to the Department in draft form no more than 180 days before the end of the Operating Period. The Department will review the Transition Plan and request any changes within a period of 30 days. The Concessionaire shall submit the final Transition Plan to the Department no more than 30 days after receiving the Department's comments.
- D. In the last 180 days of the Operating Period the Concessionaire 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 Concessionaire to Department. The Concessionaire shall endeavor to answer Department questions on any items included in the Transition Plan and any additional questions that may arise.

4.6.3 Handback Obligations

- A. Upon the end of the Term, the Concessionaire shall hand-back the HOT Lanes Project to the Department, at no charge to the Department, with asset condition having a remaining life of the greater of: (i) five years; or (ii) life within its normal lifecycle (collectively referred to as the “Handback Requirements”). In addition, if requested by the Department, the Concessionaire will dismantle the HOT Lanes toll system as required to convert the HOT Lanes back to HOV lanes; provided that the Department shall notify the Concessionaire at least one year prior to the end of the Term if the HOT Lanes are to be converted back to HOV lanes. Any such dismantling of the HOT Lanes toll system shall be at Concessionaire’s sole cost and expense.

4.7 Tolling Requirements

4.7.1 General

- A. The ETC system shall be operated and maintained by the Concessionaire 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 Concessionaire receiving notice of a problem with the dynamic tolling mechanism, the Concessionaire shall submit to the Department, for its approval, a rectification plan.
- B. The ETC system shall be operated and maintained by the Concessionaire to fulfill its obligations under the Electronic Toll Collection Agreement.

4.7.2 ETC Performance Requirements

- A. Roadside equipment shall have an ISA of at least 99%. This shall exclude scheduled downtime and loss of power or any other condition beyond the Concessionaire’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 Concessionaire.

- D. At least 99.8% 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 Concessionaire.
- E. Records shall be transmitted to the Department in the IAG specification format, or as otherwise agreed between the Department and the Concessionaire, except where VES manual quality control checks have not been completed.
- F. Tag status files are to be loaded and distributed through the system and utilized for each transaction to ensure images are recorded for the correct vehicles. This should be completed within one hour of receipt from the Department, (in accordance with the ETC Agreement) 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 Concessionaire.
- G. 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 10 (one 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.
- H. In the event the Department receives two or more representations from customers in a calendar month claiming to have been charged a HOT Lane toll from the same toll point while using the GP Lanes, the Concessionaire shall present to the Department a management plan to investigate system performance. The Department and Concessionaire agree that the customer confidence in the tolling system is essential and that misreads from the GP Lanes must be addressed as a matter of urgency.
- I. Accuracy for correctly assigning the transponder to the correct vehicle and therefore license plate, to be 99.9% 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 Concessionaire.

4.7.3 Transactions

- A. The Department (in accordance with the Electronic Toll Collection Agreement,) will supply tag status information, which should be

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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.

- B. The Concessionaire 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 Concessionaire has requested payment from an account that the Department has previously informed the Concessionaire is invalid and/or no longer in good standing, the Concessionaire must reconcile or audit the data transmission within three business days to identify all other instances that may have occurred.
- D. The Concessionaire shall use commercially reasonable efforts to ensure that no duplicate transactions or incorrect toll amounts are transmitted to the customer service center.
- E. Upon notification of a duplicate transaction or an incorrect toll amount on a per transmission basis, the Concessionaire must reconcile or audit the data transmission within three business days to identify any and all other duplicate transactions or incorrect toll charges that may have occurred.
- F. Within five days of identification, the Concessionaire shall transmit the information in accordance with the ETC Agreement.
- G. Following receipt of two or more complaints within 30 days of transponder reads from vehicles traveling in the GP Lanes emanating from a single toll point the Concessionaire shall investigate the complaints. In the event that a cross-read occurred or reasonable doubt exists as to whether a cross-read occurred, the Concessionaire shall, within 15 days of receipt of such second complaint within a 30 day period, prepare correspondence that can be sent to all customers who have made such a complaint regarding the erroneous GP reads. The Concessionaire shall provide information to the public outlining the issue with reads from tags in the GP Lanes within 15 days of the receipt of such second complaint within a 30 day period.
- H. Within seven 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 Concessionaire 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 for errors in excess of \$0.25 to be determined on a per transmission basis.

- I. Within three days of discovery or notice from the Department that an incorrect toll has been charged, the Concessionaire shall submit a plan to the Department for approval to rectify the billing problem.
- J. The Concessionaire shall ensure that, at all times, dynamic message signs along the HOT Lanes display accurate information about toll rates and other travel information. Upon notification of the display of an incorrect toll amount, the Concessionaire shall reconcile or audit the data transmission within one 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).
- K. The Concessionaire shall comply with standards applicable to the retention of and use of customer records pursuant to Law, including § 33.1-56.4 of the Code of Virginia.

4.7.4 Roadside ETC Support and Maintenance

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

4.7.5 Information Technology Support and Maintenance

The Concessionaire shall carry out information technology service management in accordance with the Agreement, including Good Industry Practice.

4.7.6 Anti-virus Scanning and Protection

- A. The Concessionaire shall maintain an updated anti-virus and protection procedure 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 Concessionaire shall immediately notify the Department of any catastrophic viral outbreak or similar destructive outbreak upon identification.

4.7.7 Interfaces

The Concessionaire 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 Concessionaire's implementation of the interfaces.

4.7.8 System Back-up and Recovery

- A. The Concessionaire 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/changed data held on the tolling system;
 - 3. removal of the media used for the daily back-up to a secure offsite location within 24 hours (or other agreed timeframe); and
 - 4. storage of one month of the data back-ups in a secure offsite location.
- B. Backups shall not affect the ETC system's ability to capture, store or process detection data.

4.7.9 System Failure

- A. The Concessionaire 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 Concessionaire 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 Concessionaire, or a third party.
- C. Where the relevant system failure affects or may affect a third party, the Department, or its agents, the Concessionaire 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 Concessionaire with all necessary assistance co-operation in resolving the relevant system failure, by cooperating fully and expeditiously with the third party or Concessionaire, as appropriate.

4.7.10 Reporting

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