REQUEST FOR PROPOSALS DESIGN-BUILD SERVICES

Metropolitan Branch Trail
Southern Segment

VOLUME II BOOK II TECHNICAL PROVISIONS

DISTRICT OF COLUMBIA
DISTRICT DEPARTMENT OF TRANSPORTATION
DCKA-2016-R-0044
Metropolitan Branch Trail RFP
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Acronyms and Abbreviations

°C  degree Celsius
°F  degree Fahrenheit
*K  degree Kelvin
µm  micrometer
A  ampere
A/D  analog to digital
A/E/C  Architecture, Engineering, Construction
AASHTO  American Association of State Highway and Transportation Officials
ABMA  American Bearing Manufacturers Association
AC  alternating current
ACHP  Advisory Council on Historic Preservation
ACM  asbestos-containing materials
ADA  Americans with Disabilities Act
ADAAG  Americans with Disabilities Act Accessibility Guidelines
AGMA  American Gear Manufacturer's Association
AISC  American Institute of Steel Construction
AISI  American Iron and Steel Institute
ANSI  American National Standards Institute
APE  Area of Potential Effect
APP  Accident Prevention Plan
APS  Accessible Pedestrian Signals
ASCE  American Society of Civil Engineers
ASSE  American Society of Safety Engineers
ASPRS  American Society for Photogrammetry and Remote Sensing
ASTM  American Society for Testing and Materials
AT  aerial triangulation
ATC  alternative technical concept
ATSSA  American Traffic Safety Services Association
AWDZ  Anacostia Waterfront Development Zone
AWG  American wire gauge
AWI  Anacostia Waterfront Initiative
AWS  American Welding Society
BMP  best management practice
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<td>CADD</td>
<td>Computer-Assisted Drafting and Design CATS construction audit tracking systems</td>
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<td>CBP</td>
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<td>CCDP</td>
<td>Concrete Containment, Collection and Disposal Plan</td>
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<td>CEB/FIP</td>
<td>Comite Euro-International du Beton/Federation de la Precontrainte</td>
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<td>CEPP</td>
<td>Chemical Emergency Preparedness Plan</td>
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<td>D/A</td>
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<td>DB</td>
<td>design-build</td>
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Technical Provisions

dB  decibel
DBA  Design-Build Agreement
DBC  Design-Build Contract
DBE  Disadvantaged Business Enterprise
DBH  diameter at breast height
DC Water  District of Columbia Water and Sewer Authority
DC  direct current
DCCR  DC Clean Rivers
DCMR  District of Columbia Municipal Regulations
DCR  District of Columbia Register
DCRA  Department of Consumer and Regulatory Affairs
DCS  document control system
DDEM  DDOT Design and Engineering Manual
DDESB  Department of Defense Explosive Safety Board
DDOE  District Department of the Environment
DDOT  District Department of Transportation
DMS  dynamic message sign
DMV  Department of Motor Vehicles
DOE  Department of Energy
DSC  Differing Site Condition
DSU  data service unit
DT  dry ton
DTM  digital terrain model
EB  Eastbound
ECM  Environmental Compliance Manager
ECP  Environmental Compliance Plan
EEO  equal employment opportunity
EIA  Electronics Industries Association
EIS  Environmental Impact Statement
EMP  Explosives Management Plan
EMR  Experience Modification Rate
EOR  Engineer of Record
EPA  U.S. Environmental Protection Agency
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<td>EPDM</td>
<td>ethylene propylene diene monomer</td>
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<td>EPTP</td>
<td>Environmental Protection Training Plan</td>
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<td>ESA</td>
<td>Environmental Site Assessment</td>
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<td>ESAL</td>
<td>equivalent single axle load</td>
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<td>ESC</td>
<td>erosion and sediment control</td>
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<td>electrostatic discharge</td>
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<td>Explosives Siting Plan</td>
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<td>Explosives Safety Submission</td>
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<td>EUAC</td>
<td>equivalent uniform annual cost</td>
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<td>emergency vehicle preemption</td>
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<td>FEIS</td>
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<td>falling weight deflectometer</td>
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<td>GIS</td>
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GPR  ground-penetrating radar
GPS  global positioning system
H&HA  hydrologic and hydraulic analysis
HAR  Highway Advisory Radio
HAZWOPER  Hazardous Waste Operations and Emergency Response Standard
HEC  Hydraulic Engineering Circular
HMA  hot mix asphalt
HMI  human-machine interfacing
HMMP  Hazardous Material Management Plan
HMS  Hydrologic Modeling System
HOV  high-occupancy vehicle
hp  horsepower
HPC  high performance concrete
HVAC  heating, ventilation, and air conditioning
Hz  hertz
I/A  Independent Assurance
I/O  inflow/outflow
IBC  International Building Code
ICBO  International Conference of Building Officials
ICC  International Code Council
ID  identification
IDC  Interdisciplinary Commitment
EIA  Electronic Industries Alliance
IEEE  Institute of Electrical and Electronics Engineers
IESNA  Illuminating Engineering Society of North America
IFC  International Fire Code
IJR  Interchange Justification Report
IMR  Interchange Modification Report
IP  importance factor
ISAT  International Seismic Application Technology
ISO  International Standards Organization
ISTMT  in-situ temperature measurement test
ITE  Institute of Transportation Engineers
ITP  Instructions to Proposers

Technical Provisions
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<td>Intelligent Transportation Systems</td>
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<td>JBAB</td>
<td>Joint Base Anacostia-Bolling</td>
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<td>JDAC</td>
<td>Joint Development and Adjacent Construction</td>
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<tr>
<td>km/hr</td>
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<td>ksi</td>
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<td>kilovolt</td>
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<td>KVA</td>
<td>kilo-volt-amperes</td>
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<td>local area network</td>
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<td>LLD</td>
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<td>LLDPE</td>
<td>linear low-density polyethylene</td>
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<td>lm/w</td>
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<td>maximum extent practicable</td>
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<td>mph</td>
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<td>Multi-resolution Seamless Image Database</td>
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<td>pound per square inch</td>
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<td>Public Space Regulations Administration</td>
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<td>PTI</td>
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<td>RID</td>
<td>Reference Information Document</td>
</tr>
<tr>
<td>ROD</td>
<td>Record of Decision</td>
</tr>
<tr>
<td>RoHS</td>
<td>reduction of hazardous substances</td>
</tr>
<tr>
<td>ROM</td>
<td>rough order of magnitude</td>
</tr>
<tr>
<td>ROW</td>
<td>right-of-way</td>
</tr>
<tr>
<td>RPM</td>
<td>raised pavement markers</td>
</tr>
<tr>
<td>RUS</td>
<td>rural utilities service</td>
</tr>
<tr>
<td>SAE</td>
<td>Society of Automotive Engineers</td>
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<td>SCADA</td>
<td>supervisory control and data acquisition</td>
</tr>
<tr>
<td>SDI</td>
<td>Steel Door Institute</td>
</tr>
<tr>
<td>SE</td>
<td>Southeast</td>
</tr>
<tr>
<td>SEP</td>
<td>Subsurface Exploration Plan</td>
</tr>
<tr>
<td>SHPO</td>
<td>State Historical Preservation Office</td>
</tr>
<tr>
<td>SHV</td>
<td>specialized hauling vehicle</td>
</tr>
<tr>
<td>SI</td>
<td>site inspection</td>
</tr>
<tr>
<td>SIR</td>
<td>Site Investigative Report</td>
</tr>
<tr>
<td>SMFO</td>
<td>single-mode fiber optic</td>
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<tr>
<td>SOQ</td>
<td>Statement of Qualifications</td>
</tr>
<tr>
<td>SOV</td>
<td>Schedule of Values</td>
</tr>
<tr>
<td>SOW</td>
<td>Statement of Work</td>
</tr>
<tr>
<td>SPCC</td>
<td>Spill Prevention, Control, and Countermeasures</td>
</tr>
<tr>
<td>SPD</td>
<td>surge protective device</td>
</tr>
<tr>
<td>STP</td>
<td>shielded twisted pair</td>
</tr>
</tbody>
</table>
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SUE  subsurface utility engineering
SW   Southwest
SWMG Stormwater Management Guidebook
SWMM Stormwater Management Modeling
SWMP Stormwater Management Plan
SWPPP Storm Water Pollution Prevention Plan
TB   terabyte
TCB  temporary concrete barrier
TCP  Traffic Control Plan
TCS  Traffic Control Supervisor
TESC temporary erosion and sediment control
THD  total current harmonic distortion
TIA  time impact analysis
TIMP Traffic Incident Management Plan
TMA  truck-mounted attenuator
TMP  Traffic Management Plan/Transportation Management Plan
TP   technical paper
TPH-DRO total petroleum hydrocarbon – diesel range organics
TRB  Transportation Research Board
TS&L type, size, and location
TSMC Traffic Systems Management Center
TSO  Traffic Safety Officer
TSP  Training Services Provisions
UBIT under-bridge inspection truck
UL   Underwriters Laboratories
UPS  uninterruptible power supply
URD  utility relocation design
USACE U.S. Army Corps of Engineers
USCG U.S. Coast Guard
USCS Unified Soil Classification System
USDA U.S. Department of Agriculture
USDOT U.S. Department of Transportation
USFWS  U.S. Fish and Wildlife Service
UST underground storage tank
UV ultraviolet
UXO unexploded ordnance
V volt
VECP Value Engineering Change Proposal
VMS variable message sign
VQC Visual Quality Concept
VQM Visual Quality Manual
VWR value of work remaining
W watt
WAC Washington Administrative Code
WB Westbound
WBS work breakdown structure
WIM weigh in motion
WMATA Washington Metropolitan Area Transit Authority
WNY Washington Navy Yard
WTI West Texas Intermediate
WZCZ Work Zone Clear Zone
WZTEM Work Zone Traffic Engineering Manager
XCU explosion, collapse, and underground
1. General Information

1.1 General

The District Department of Transportation (DDOT) intends to allow the Design-Build (DB) Contractor flexibility in design and construction by accommodating the processes, procedures, and innovative techniques that are preferred by the DB Contractor, as long as they are consistent with the project goals identified and established for the Project, good engineering practices, industry standards, and the standards, guidelines, performance requirements, and procedures identified in the Contract.

1.1.1 Submittals

1.1.1.1 Design Stages

DB Contractor shall classify design submittals in accordance with the following general design stages:

- Preliminary Design;
- Intermediate Design; and
- Final Design.

DB Contractor shall determine the appropriate level of design completion for each stage using the requirements of the Contract Documents, DDOT Standards, and submittal requirements within the individual Technical Provisions in order to ensure all Project requirements are met.

Except where required elsewhere in the Contract Documents, design of different Project elements, engineering disciplines, and geographic sections of the Project shall be:

- initiated at Preliminary Design or Intermediate Design stage; and
- include a minimum of two submittals, which shall include Final Design and either Preliminary Design or Intermediate Design.

The content of submittals for Third Parties and Utilities shall be as required by the Third Parties and Utilities and as required in Third Party Agreements. Submittal requirements for DC Water shall follow DC Water standards and requires submittals at Preliminary, Intermediate and Final Design.

1.1.1.2 Release for Construction Documents

Release for Construction Documents (RFCD) shall be used by the DB Contractor to construct the Project. The RFCD shall include plan sheets, specifications, shop drawings, working drawings, and other pertinent information as applicable. The RFCD may only be issued by the DB Contractor after all previous comments related to the elements have been addressed and appropriately incorporated, non-conformance have been corrected, and appropriate Approvals and permits have been obtained.

DB Contractor shall submit RFCD for information before commencing the Work contained in the RFCD.

1.1.2 Submittal Review and Comment

The DB Contractor’s schedule shall allow for a 21-Calendar-Day review and comment period for DDOT to review and provide comment on all design and plan submittals except as follows; The DB Contractor’s schedule shall allow for a 28-Calendar-Day review and comment period for Demolition Plans, and Trail Design Plans.

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DDOT reserves the right to extend the stated review and comment period by up to seven Calendar Days for submittals that are received between November 15 and January 1 and for submittals with overlapping review periods that are being reviewed by the same discipline team. However, failure to provide review comments within the establish time period does not constitute acceptance.

The DB Contractor shall address all comments made by DDOT to the satisfaction of DDOT for each submittal and shall include a comment resolution matrix in subsequent submittals.

The DB Contractor shall schedule comment resolution meetings with DDOT and shall document minutes of all comment resolution meetings. It is intended that all comments will be resolved at these meetings. If agreement is not reached on any specific comment, it shall be resolved as described in the QMP.

1.2 Performance Requirements

1.2.1 Project Documentation

See Section 12 for Project Documentation requirements.

1.2.2 Software

1.2.2.1 General

The DB Contractor shall acquire, use, and maintain all software for the Project.

Version – The DB Contractor shall use the current version of the specified software in effect as of Notice to Proceed1 (NTP1), unless otherwise specified in this Section.

Updates – The DB Contractor shall update software programs throughout the Contract within six months of release of a software update, or earlier, if mutually agreed upon with DDOT. DDOT will similarly update its software.

File Server – The DB Contractor shall store all data files for the software programs on, or have them accessible through, the DB Contractor’s central file server.

1.2.2.2 Required Project Software

The DB Contractor, to the maximum extent possible, utilize e-Builder ® (e-Builder) for all submittals. Additionally, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

In addition to any other software specified in the Contract, the DB Contractor shall use the software programs described in each of the appropriate Technical Provisions.

The DB Contractor shall also use the following software:

1. Microsoft Word for word processing
2. Microsoft Excel for spreadsheets
3. Microsoft Access for databases
4. Adobe Acrobat
5. Primavera P6, Version 8 for scheduling

1.3 Design and Construction Requirements
All material removed and not reused in the construction of this project shall be removed from the project site and disposed of by the DB Contractor.

### 1.3.1 Staging and Access Areas

The DB Contractor may use the trail base course for construction access at his own risk. Construction access will be allowed through Aggregate Industries, see the right-of-entry (ROE) agreement for location. Staging areas are accounted for in the Limits-of-Disturbance (LOD) shown on the Volume II, Book IV Contract Drawings. See the ROE agreement with Aggregate Industries for additional staging area locations.

All items related to staging and access will be temporary. The DB Contractor is responsible for the complete restoration of these areas to the satisfaction of DDOT, NPS, WMATA, CSXT, and Aggregate Industries at no additional cost to DDOT.

Staging and access requirements shall meet DDOT Standard Specifications for Highways and Structures.

### 2 Scope of Work

The planned Project consists of the design and construction of a new trail adjacent to CSX tracks and WMATA Red Line tracks along John McCormack Drive, adjacent to Fort Totten Metro Station, and on NPS property in NE, Washington D.C. The trail begins approximately 1500 feet south of Bates Road NE on the east side of John McCormack Drive NE, extending north along the WMATA and CSX tracks to the Fort Totten Metro Station tie in with First Place NE. An existing trail connection from Gallatin Road NE to the Fort Totten Metro Station will be reconstructed as a part of the Project.

All work for the Project shall remain inside the Limits of Disturbance (LOD) line as shown on the plans in Volume II, Book IV Contract Drawings with the following exception.

- Existing street light poles from the beginning point of the project south to Michigan Avenue shall have the existing luminaires replaced with new LED cobrahead luminaires, see Section 16 of these Technical Provisions for details.

The full scope of work includes, but is not limited to, the following items:

- provide mobilization and demobilization, provision and maintenance of Engineer’s field facilities, field layout, employee training, and other incidental work required for a quality, complete and finished product.
- establishment and maintenance of vehicular and pedestrian traffic including signs, barricades and other transition devices; reconfiguring the devices in conjunction with changes in work areas; and their removal and disposal upon project completion, including restoration of disturbed areas.
- clearing and grubbing, as required within the LOD;
- removal of unsuitable material, excavation, and backfilling and pervious paving to construct a new trail;
- protection of trees during construction;
- provide ADA compliant trail connections and pedestrian ramps;
- provide retaining walls as necessary to stay within the LOD and minimize property impacts following visual requirements specified for retaining walls on NPS property;
• provide new permanent regulatory and wayfinding signs for the trail and all trail connection intersections;
• provide road and trail pavement markings;
• provide landscaping within the LOD for the Project including special requirements for landscaping on NPS property;
• provide erosion and sediment control measures, stormwater management facilities, including pervious asphalt pavement and bioretention facilities;
• provide utility coordination, identification, locating, and protection of all utilities encountered during design and construction including relocation of Pepco poles along Aggregate Industries property; and
• provide new WMATA security fencing between the trail and CSXT tracks as required by the Technical Provisions

3 Mandatory Standards

The Design-Build Contractor shall perform all design and construction work in accordance with all applicable State and Federal Laws, the requirements set forth by the documents contained in Volume II, Book III - Contract Data and Reports, and Book IV – Contract Drawings, and the Mandatory Standards and/or publications contained herein. The DB Contractor shall verify and use the most current version of mandatory manuals, guides, and/or publications as of the Setting Date unless specified otherwise in the Technical Provisions.

All references to “Contractor” within the DDOT Standard Specifications for Highways and Structures shall be understood to read “Design-Build Contractor” and delete all references to measurement and payment.

All words such as “should,” “may,” “could,” “can,” “usually,” “normally,” and “generally” shall be interpreted in the light most favorable to the District.

When a standard refers to “Chief Engineer” or “Project Manager”, such references shall mean the Design-Build Contractor’s Engineer of Record or Project Manager as applicable, relative to the design, planning, execution, and overall delivery of the Project, unless otherwise specified. It shall be at DDOT’s sole discretion to determine when these terms refer to DDOT’s Chief Engineer or Project Manager.

In the event of any conflict between any District of Columbia requirements, Federal Requirements, or other requirements of the Contract Documents, the Federal Requirements shall prevail, take precedence, and be in force over and against any such conflicting provisions, unless the District of Columbia requirements are more stringent as allowed by federal law.

In the event a conflict in requirements exist in an individual Mandatory Standard, the DB Contractor shall request a ruling from DDOT as to which requirement is to be used for this Project. It shall be at DDOT’s sole discretion to determine which requirement is to be used.

1. AASHTO Roadside Design Guide
2. AASHTO Highway Drainage Guide
3. AASHTO A Policy on Geometric Design of Highways and Streets
4. AASHTO Guide for the Design of Pavement Structures
5. AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities
6. AASHTO Manual for Assessing Safety Hardware (MASH)
7. AASHTO Guide for the Development of Bicycle Facilities
8. AASHTO LRFD Bridge Design Specification
10. ADA Standards for Accessible Design
11. American Society for Photogrammetry and Remote Sensing (ASPRS) (Map) Accuracy Standards
12. ANSI/ASSE, A10-Construction and Demolition Standards
13. AREMA Manual for Railway Engineering
14. ASTM - American Society of Testing Materials
15. CSXT Public Project Information for Construction and Improvement Projects that may Involve the Railroad
16. DC Electrical Code
17. DC Water Green Infrastructure Utility Protection Guidelines
18. DC Water Standards and Specifications
19. DCRA Manual of Practices For Real Property Surveying in the District of Columbia
20. DOEE Notice of Final Rulemaking DC Water Quality Standards
21. DOEE Stormwater Management Guidebook
22. DDOH Standards and Specifications for Soil Erosion & Sediment Control
23. DDOT Standard Specifications for Highways and Structures
27. DDOT Work Zone Temporary Traffic Control Manual
28. DDOT Pedestrian Safety and Work Zone Standards—Covered and Open Walkways
29. DDOT MicroStation V8 CAD Standards Manual
30. DDOT Standard Drawings
31. DDOT Green Infrastructure Design Standards
32. DDOT Work Zone Safety and Mobility Policy
33. DDOT Environmental Manual
34. DDOT Public Realm Design Manual
35. DDOT DC Street Light Policy and Design Guidelines
36. DDOT Utility Work Zone Traffic Control Plans (TCP) Typicals
37. DDOT Wayfinding Signage Program
38. DDOT DB Contractor’s Minimum Testing Requirements for Control of Materials
39. DDOT Street Light Policy and Design Guidelines
40. EIA Electronic Industries Alliance Standards and Technical Publications
41. EIA/TIA Fiber Optic Test Procedure Standards
42. Federal Geographic Data Committee (FGDC) Geospatial Positioning Accuracy Standards, Part 4: Standards for Architecture, Engineering, Construction (A/E/C), and Facility Management
43. FHA, USDOT – Bicycle and Pedestrian Program, FHWA Accommodating Bicycle and Pedestrian Travel: A Recommended Approach
44. FHWA Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)
45. FHWA Traffic Control Systems Handbook
46. FHWA Standard Highway Signs and Markings (English Version)
47. FHWA Work Zone Safety and Mobility Rule
48. FHWA Work Zone Safety and Mobility Rule, Implementing the Rule on Work Zone Safety and Mobility
49. FHWA Work Zone Safety and Mobility Rule, Work Zone Public Information and Outreach Strategies
50. FHWA Work Zone Safety and Mobility Rule, Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects
51. FHWA Traffic Monitoring Guide
52. FHWA Hydraulic Design Series No. 2, Highway Hydrology
53. FHWA Hydraulic Design Series No. 3, Design Charts for Open Channel Flow
54. FHWA Hydraulic Design Series No. 4, Introduction to Highway Hydraulics
55. FHWA Hydraulic Design Series No. 5, Hydraulic Design of Highway Culverts
56. FHWA Hydraulic Engineering Circular Number 14 (HEC-14), Hydraulic Design of Energy Dissipaters for Culverts and Channels
57. FHWA Hydraulic Engineering Circular Number 15 (HEC-15), Design of Roadside Channels with Flexible Linings
58. FHWA Hydraulic Engineering Circular Number 22 (HEC-22), Urban Drainage Design Manual
60. ISO 14000 – Environmental Management Systems – Requirements with Guidance for Use
62. NACTO Urban Bikeways Design Guide
64. National Electrical Manufacturers Association (NEMA), Standard TC-10
65. NFPA 70 National Electrical Code
4 Demolition

4.1 General
Demolition shall consist of the complete or partial removal and disposal of various materials from within the Project Limits. Demolition includes, but is not limited to, the removal and disposal of pavements, curbs, gutters, sidewalks, rocks, walls, traffic signal and street light equipment, pole and cabinet foundations, drainage structures and storm drains, signs, and other ancillary items necessary to facilitate the design and construction of the Project.

Demolition shall be performed in accordance with applicable District of Columbia and federal laws.

Unless otherwise specified herein, the material generated from structure, site, and building demolition shall become the Design-Build (DB) Contractor’s property. All material removed shall be properly disposed of by the DB Contractor outside the limits of the Project.

The DB Contractor shall obtain all necessary Approvals and permits as required for the performance of demolition activities and the legal disposal of demolished materials, except as noted in Section 8 of these Technical Provisions.

Adjacent Utilities will be identified and protected in accordance with Section 10 of these Technical Provisions and the guidelines provided by each Utility. The DB Contractor will coordinate with affected Utilities and afford the Utilities access to the Project to ensure their respective Utilities are being protected in accordance with each Utility’s guidelines.

The DB Contractor will coordinate with the Washington Metropolitan Area Transit Authority (WMATA) for demolition activities in the vicinity of WMATA facilities. Demolition activities will be subject to seismic restrictions and monitoring requirements in accordance with WMATA guidelines.

See Section 8 of these Technical Provisions for details regarding hazardous materials inspection and abatement requirements. See Section 10 of these Technical Provisions for details regarding Utility removal and abandonment requirements.

Use of explosives as a method of structure demolition will not be permitted.

4.2 Performance Requirements
Not used.

4.3 Design Requirements
4.4 Construction Requirements

4.4.1 Permits and Approvals
Prior to the start of any demolition operations:

1. Acquire all necessary governmental Approvals and Third-Party Approvals for any and all demolition activities to be conducted;
2. Meet all environmental requirements; and
3. Submit all executed permits and Approvals to DDOT for records.

4.4.2 Site and Building Demolition
The DB Contractor shall develop detailed Demolition Work Plans for the Project in accordance with the requirements of Section 24 of these Special Provisions that delineate existing facilities to be removed. Items to be demolished located within the limits of the proposed trail shall be demolished to a minimum depth of five (5) feet below proposed subgrade or bottom of proposed structure foundation and backfilled with suitable material. Items being demolished which are outside of the limits of the proposed trail shall be demolished to a minimum depth of two (2) feet below finished grade, backfilled with suitable material, and landscaped in accordance with Section 15 of these Technical Provisions, except as otherwise noted.

Items such as pavements, curbs, gutters and sidewalks at locations where depth is in excess of the stated minimum depth requirements, may be wrecked and left in place with no piece of the wrecked material exceeding 18 inches in its greatest dimension.

Building demolition will be performed in accordance with all applicable local and federal regulations and permit requirements. See Section 8 and Section 24 of these Technical Provisions for additional requirements.

4.4.3 Salvage of Materials
The DB Contractor will salvage materials and deliver them, in good condition, to a location designated by DDOT.

For the purpose of salvaged materials, “good condition” is defined as follows: the materials are removed in a manner that does not damage them, and the materials are in such condition that they could be reused immediately for their intended purpose.

Every effort will be made by the DB Contractor to salvage items in good condition and to protect the salvaged materials from theft or damage until such time as they are delivered to DDOT.

4.5 Submittals

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
<th>Submittal</th>
<th>DDOT Review Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.4.2</td>
<td>Demolition Plans</td>
<td>Review and Approve</td>
</tr>
</tbody>
</table>
5.1 General
Design deviations include two types of documented decisions of changes to the design criteria for designing a trail element, or a segment of trail that does not meet minimum values or ranges established for that trail project:

1. A Design Waiver is required on DDOT owned and maintained facilities when design criteria meet or exceed AASHTO and Americans with Disabilities Act Accessibility Guidelines (ADAAG) minimum design standards but fall short of DDOT’s minimum design standards and/or manuals. The DB Contractor shall prepare and submit all Design Waivers in a timely manner to the DDOT Chief Engineer for Approval.

2. A Design Exception is required on DDOT owned and maintained facilities when design elements fail to meet AASHTO minimum design standards. The DB Contractor shall prepare and submit all Design Exceptions for Approval from the DDOT Chief Engineer prior to receiving Approval on Released for Construction Plans.

The DB Contractor shall be responsible for all work associated with design deviations, up to and including preparation, documentation, submission and comment responses.

The DB Contractor shall obtain DDOT Chief Engineer and/or FHWA Approval on all design deviations prior to the issuance of Released for Construction plans.

5.2 Performance Requirements
Not applicable.

5.3 Design Requirements
All deviations prepared by the DB Contractor shall be prepared by, or under the direct supervision of, a Professional Engineer licensed in the District. Each design deviation request shall carry the Professional Engineer’s stamp. See Exhibit 5.1 for known deviations based on the design provided in the Book IV - Contract Drawings. A design exception has been approved by DDOT for this requirement and is included in Book III – Contract Data.

<table>
<thead>
<tr>
<th>Alignment Name</th>
<th>From Est. Station</th>
<th>To Est. Station</th>
<th>Side</th>
<th>Design Feature</th>
<th>Standard Required</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>Met Branch Trail</td>
<td>86+63</td>
<td>100+10</td>
<td>RT</td>
<td>Buffer</td>
<td>5 feet</td>
<td>Limited ROW between road and CSXT/WMATA fence</td>
</tr>
</tbody>
</table>

5.4 Construction Requirements
Not applicable.

5.5 Submittals
In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.
5.5.1 Summary of Submittals

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
<th>Submittal</th>
<th>DDOT Review Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.1</td>
<td>Design Deviations</td>
<td>Review and Approve</td>
</tr>
</tbody>
</table>

6 Surveys and Mapping

6.1 General
The DB Contractor shall conduct all Work necessary to complete the land surveying and surveys and mapping for the Project. This Work includes, but is not limited to, horizontal and vertical control surveys, topographic surveys, Right-of-Way (ROW) surveys, bridge surveys, Utility surveys, construction surveys, As-Built surveys, boundary and ROW surveys, Land Corner Records, and all other land surveying services necessary to complete the Project. The DB Contractor shall obtain all necessary permits prior to beginning field Work.

6.1.1 Reference Documents
DDOT will provide Project control, surveys and mapping as Contract Documents. The DB shall determine the suitability of the Reference Documents for use on the Project and shall provide any revisions, corrections, or additional land surveys and mapping that is required to perform the work.

The following is provided in Volume II, Book III, Contract Data and Reports.
1. Mapping products in MicroStation V-8 format in DDOT CAD Specifications.
2. DTM data in InRoads Format.

Mapping was developed by Aero-Metric, Inc. utilizing fixed wing and helicopter aerial photography flown by Richard Crouse and Associates, Inc.

6.2 Performance Requirements

6.2.1 General
The DB Contractor shall perform additional field survey Work as necessary and suitable for preparation of design documents and Released for Construction Documents, which shall meet the technical requirements defined herein.

The DB Contractor shall obtain all necessary permits prior to beginning field Work. All surveys shall conform to standards referenced herein in addition to technical means, methods, procedures, and standards, record-keeping requirements, equipment use, and safety precautions required by all governing agencies.

The DB Contractor is solely responsible for the accuracy of content and completeness of all survey information.
Metropolitan Branch Trail RFP

developed or used in the design and construction of the Project, including verification of the primary survey
control data provided in Reference Documents. Survey accuracy shall be appropriate to the task and shall
meet the minimum accuracy standards provided in Exhibit 6-1.

The DB Contractor shall verify and confirm the location, accuracy, and datum of all survey data and survey
information, regardless of the source. The DB Contractor shall document their verification of all of the data in
accordance with the Quality Management Plan (QMP) requirements in Section 28, of these Technical
Provisions, and submit notice of acceptance of data to DDOT. Any discrepancies between the survey data
and the survey information provided by DDOT shall be brought to DDOT’s attention for resolution. It is the
sole responsibility of the DB Contractor to confirm the accuracy and acceptability of all survey data provided
by DDOT prior to using the data.

Exhibit 6-1 - Minimum Survey Accuracy

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Accuracy Standards and Methods/Procedures</th>
<th>Horizontal Accuracy</th>
<th>Vertical Accuracy</th>
<th>Vertical Minimum Point Closure Standard or Equivalent</th>
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<tbody>
<tr>
<td>Control - Primary</td>
<td>FGDC (Note 1)</td>
<td>2nd Order Class I</td>
<td>2nd Order Class I</td>
<td>0.025 (\text{vm} ) (m=miles)</td>
</tr>
<tr>
<td>Control - Secondary</td>
<td>FGDC (Note 1)</td>
<td>2nd Order Class II</td>
<td>2nd Order Class II</td>
<td>0.035 (\text{vm} ) (m=miles)</td>
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<td>Supp Control</td>
<td>FGDC (Note 1)</td>
<td>Range from 2nd Order Class II for Secondary to 3rd Order for Tertiary control</td>
<td>Range from 2nd Order Class II for Secondary to 3rd Order for Tertiary control</td>
<td>0.035 (\text{vm} ) for 2nd Order Class II to 0.05(\text{vm} ) for 3rd Order Tertiary control (m=miles)</td>
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<tr>
<td>Topo Base Mapping - Upland</td>
<td>ASPRS (Map) Accuracy Standards</td>
<td>Class 1</td>
<td>Class 1</td>
<td>1 foot Contour Interval (CI)</td>
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<tr>
<td>Topo Base Mapping - Bathy</td>
<td>ASPRS (Map) Accuracy Standard</td>
<td>Class 1</td>
<td>Class 1</td>
<td>1 foot CI</td>
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<tr>
<td>Bridge Survey</td>
<td>FGDC (Note 1)</td>
<td>Positional tolerance of 0.03 foot</td>
<td>Positional tolerances of 0.02-feet on hard surfaces and 0.1-feet on soft surfaces</td>
<td></td>
</tr>
<tr>
<td>Utility Location</td>
<td>Location - Utility ASCE (Note 2) - and FGDC (Note 1)</td>
<td>Quality Level A or B depending on Project needs and FGDC positional tolerance of 0.2 to 0.5 foot per FGDC Part 4</td>
<td>Quality Level A or B depending on Project needs and FGDC positional tolerance of 0.1 to 0.2 foot per FGDC Part 4</td>
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</tr>
<tr>
<td>Settlement / Subsidence Monitoring Surveys</td>
<td>FGDC (Note 1)</td>
<td>Positional tolerance range from 0.01 foot to 0.03 foot per FGDC Part 4</td>
<td>Positional tolerance 0.01 foot per FGDC Part 4</td>
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<tr>
<td>Design Surveys</td>
<td>FGDC (Note 1)</td>
<td>Positional tolerance of 0.05 foot</td>
<td>Positional tolerances of 0.03 foot on hard surfaces and 0.1 foot on soft surfaces</td>
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<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Accuracy Standards and Methods/Procedures</th>
<th>Horizontal Accuracy</th>
<th>Vertical Accuracy</th>
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</thead>
<tbody>
<tr>
<td>Construction Layout Survey</td>
<td>FGDC (Note 1)</td>
<td>Positional tolerance range from 0.01 foot to 1.0 foot per FGDC Part 4</td>
<td>Positional tolerance range from 0.01 foot to 0.5 foot per FGDC Part 4</td>
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<tr>
<td>As-Built Surveys</td>
<td>FGDC (Note 1)</td>
<td>Positional tolerance range from 0.2 foot to 1.0 foot per FGDC Part 4</td>
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<td>Right-of-Way Acquisition Surveys</td>
<td>ROW Manual (Note 3) and Manual of Practice For Survey in the DC (Note 4)</td>
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<td>ROW Stake out</td>
<td>ROW Manual (Note 3) and Manual of Practice For Survey in the DC (Note 4)</td>
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**Note 1:** FGDC Geospatial Positioning Accuracy Standards, Part 4: Standards for Architecture, Engineering, Construction (A/E/C), and Facility Management

**Note 2:** Utility ASCE

**Note 3:** ROW Manual

**Note 4:** Manual of Practice For Survey in the DC

**Note 5:** The horizontal and vertical accuracy requirements identified in Exhibit 6-1 may increase to a higher accuracy requirement dependent on Project needs.

### 6.2.2 Survey Manager

The DB Contractor shall designate a Survey Manager for the Project experienced in all aspects of survey requirements for civil construction. The DB Contractor’s designee shall have sufficient knowledge, expertise, and experience to supervise the surveying service required to complete this Project which may include establishing supplemental control, topographic surveys suitable for design, recovery, and establishing property and ROW lines. All survey Work shall be prepared by, or under the direct supervision of, the Survey Manager. The Survey Manager shall be the single point of contact for all survey activities and shall document, certify, sign, and seal all survey activities completed under this Contract.

It is the responsibility of the DB Contractor to comply with all federal and local regulations related to the Practice of Surveying, which may require supervision by a Surveyor Licensed in the District of Columbia.

### 6.3 Design Requirements

#### 6.3.1 Datum and Units

The DB Contractor shall perform all land survey and mapping in accordance with the following:

- **Units:** US Survey Feet
- **Horizontal Datum:** Maryland Coordinate System, North American Datum 1983/1991 adjustment (NAD 83/91)
- **Vertical Datum:** District Department of Public Works

### 6.4 Construction Requirements
6.4.1 General
The DB Contractor shall maintain detailed survey records, including a description of the Work performed on each shift and the methods and control points used on the shift. The records shall include adequate detail to allow the survey to be reproduced, including graphic notes depicting control points used and their relationship to other control points or reference points; descriptions; coordinates; and location descriptions of the points used or set.

Bench marks and temporary bench marks shall also have graphic notes depicting descriptions, elevations, coordinates, and location descriptions.

Furnish survey instruments and supporting equipment that achieve the required tolerances associated with the Work. Checking and calibration of equipment will be according to current best practices.

Survey Work by the DB Contractor shall include the following:

- verifying all survey data furnished by DDOT;
- expanding and supplementing the control network as additional permanent survey control is needed for the Project;
- providing recovery data sheets of permanent control stations to DDOT in both hard and electronic copy;
- conducting topographic surveys, including detailed mapping and bathymetry, to support design activities to be completed by the DB Contractor; and
- conducting construction surveys including, but not limited to: walls, grading, drainage, channelization, pavement markings, illumination, barriers, and signage. The DB Contractor shall provide staking and layout as necessary to adequately locate, construct, and check the specific construction activity.

All permanent secondary control points shall be shown on a Survey Mark form and shall be tied to the ROW centerline alignment labeled on a Post Construction Record of Survey. Permanent secondary control points shall be established in accordance with the standards, specifications, and methods described and referenced herein.

The DB Contractor shall write a formal Survey Report for all survey calculations related to survey control networks, road alignments, settlement monitoring, property boundaries, public land survey system surveys, and ROW surveys. The intent of each report is to document and perpetuate the information and rationale used to determine the survey data that is part of the Project.

The reports shall include information related to the source data used, the calculations performed, closures achieved and the data produced as part of the survey process.

The DB Contractor shall provide DDOT with copies of all calculations and staking data prior to it being used for construction operations.

The DB Contractor shall maintain copies of all notes, calculations, staking data, drawings, and QC measures. The information will be available for auditing by DDOT upon request and DDOT may request the submittal of calculations and field notes in hard copy or electronic (pdf) or both.

DB Contractor shall submit Survey Records within 30 Days of substantial completion.

6.4.2 Monumentation

6.4.2.1 General
The DB Contractor shall document all DDOT and governmental monuments and property corners that will be modified, disturbed, or destroyed during the Contract including geodetic primary control monuments. This Technical Provisions
includes survey control stations, horizontal and vertical control monuments establish by any agency, and existing boundary and ROW boundary markers. The DB Contractor shall complete a Monument Report to notify DDOT of any and all monuments that could potentially be disturbed, modified, or destroyed, along with a plan to preserve and replace any monument potentially impacted and submit to DDOT 30 days prior to any disturbance.

6.4.2.2 DDOT Monumentation

The DB Contractor shall note all DDOT geodetic and Washington Metropolitan Area Transit Authority (WMATA) and all other government control stations found within the Project Limits on a Record of Survey or Monumentation Map. Upon receipt of the Monument Report, DDOT will determine the monuments to be replaced by the DB Contractor.

The DB Contractor shall notify the appropriate agency, organization, or business for all monuments that will potentially be disturbed, destroyed, or relocated. Monuments removed or disturbed prior to submitting an approved notification and exhibit map will be replaced at the DB Contractor’s cost.

The DB Contractor will replace any DDOT geodetic monument within the Project that may be disturbed or destroyed. The DB Contractor shall label all monuments removed, replaced, or set on the Post Construction Record of Survey described in this Section. The DB Contractor shall work with DDOT to determine the best location, as near as possible to the original location, to assure that a replacement monument is in a location that will be out of the area of disturbance and serves the need of the Project.

Existing property corners within the Project Limits that are verified by recorded documents shall be replaced in compliance with District of Columbia regulations and methods and Approved by DDOT and by the District of Columbia Office of the Surveyor.

6.4.3 Preconstruction Survey

Immediately after NTP, the DB Contractor shall take a sufficient number of pre-construction photographs and a high-quality video of the Site, including roadways, structures, drainage, and all areas necessary to or anticipated to be impacted by the Work, in high-definition format so as to resolve any disputes that may arise regarding the conditions prior to and subsequent to construction.

Prior to starting any Work, the DB Contractor shall make a detailed inspection of buildings, structures, roadways, sidewalks, retaining walls, landscaping, and related surface improvements adjacent to and in the vicinity of the proposed Work, wherever located. The inspection shall include notes, measurements, and a DVD, with audio sound track, of all facilities prior to the start of construction. The audio description of the inspection shall include the date, time, weather conditions, address/stationing/location, brief description of the facility, and description of physical conditions encountered.

Copies of all notes, measurements, video tapes, reports, and data shall be submitted to DDOT as soon as these records are complete and prior to start of any construction activity.

If a dispute arises where no or insufficient photographic or video evidence of its existing condition is available, the disputed area shall be restored to the extent directed by DDOT at no additional cost to DDOT.

6.4.4 Traffic Control Plans for Survey Work

The DB Contractor shall prepare a Maintenance of Traffic Plan whenever a survey crew or a survey crew’s vehicle will be working within any roadway clear zone. Submittal, review, and Approval of the Maintenance of Traffic Plan shall be in accordance with Section 22 of these Technical Provisions.
6.4.5 As-Built Survey
The DB Contractor shall produce reports documenting the location of the As-Built alignments, profiles, drainage structures, Utilities, walls, bridges, and placement of the survey-control monument. These reports shall include descriptive statements for the survey methods used to determine the As-Built location of the feature being surveyed. Where DDOT has provided data to the DB Contractor in x, y, z-coordinate format, the DB Contractor shall provide DDOT with data in x, y, z-coordinate format. Where DDOT has provided data to the DB Contractor in x, y-coordinate format only, or z-coordinate format only, the DB Contractor shall provide DDOT with data in x, y-coordinate format only, or z-coordinate format only, respectively.

All x, y, and z coordinates shall be provided in the Project coordinate system and horizontal and vertical datum.

The DB Contractor shall provide DDOT with an As-Built survey base map file in the Project’s coordinate system I and vertical datum, and in accordance with the format for the software programs provided in Section 1 of these Technical Provisions.

The DB Contractor shall deliver all As-Built survey files to DDOT within 30 Calendar Days of Substantial Completion of the Project.

6.4.6 Post Construction Record of Survey
The DB Contractor shall provide DDOT with a hard copy and an electronic file of the Post Construction Record of Survey within 30 Days of substantial completion. A draft copy shall be submitted to DDOT for review prior to recording with the District of Columbia Office of Survey. A Mylar hard copy that includes recording numbers and an electronic file shall be delivered at the time of Substantial Completion, unless an earlier delivery is requested by DDOT. The electronic format shall be compatible with DDOT’s format. The Post Construction Record of Survey shall include, but is not limited to, the following:

1. All monuments that have been removed by construction activities, with symbols and notes to identify whether they have been replaced.
2. All permanent secondary and tertiary horizontal and vertical control points established by the DB Contractor shall be defined by the Project’s State Plane coordinate system and horizontal and vertical datum (x, y and z) and by station, and offset to the ROW centerline alignment. All permanent control points shall be accompanied by a Report of Survey Mark.

All monuments, remaining undisturbed and/or set during this Contract, shall be defined and identified by station and offset to the ROW centerline alignment.

6.5 Submittals
In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

6.5.1 Summary of Submittals

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
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<th>New Survey Deliverables</th>
<th>DDOT Review Type</th>
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### Item | Section | Submittal | New Survey Deliverables | DDOT Review Type
--- | --- | --- | --- | ---
1 | 6.1.1 6.4.1 | Control - Primary and Secondary | New surveys as needed | Submit
2 | 6.4.1 | Control - Supplemental | New surveys as needed | Submit
3 | 6.1.1 6.4.1 | Topo Base Mapping - Upland | New surveys and mapping as needed | Submit
4 | 6.1.1 6.4.1 | Topo Base Mapping - Bathymetry | New surveys and mapping as needed | Submit
5 | 6.4.2 | Monument Report | Survey deliverables (see Note 1) | Review and Comment
6 | 6.4.3 | Preconstruction Surveys | Survey deliverables (see Note 1) | Submit
7 | 6.4.1 | Survey Reports | Survey deliverables (see Note 1) | Review and Comment
8 | 6.4.1 | Survey Records | Survey deliverables (see Note 1) | Submit
9 | 6.4.5 | As-Built Surveys | Survey deliverables (see Note 1) | Review and Comment
10 | 6.4.6 | Post-Construction Record of Survey | Survey deliverables (see Note 1) | Review and Comment

**Note 1:** Includes field notes; computations; map products (hardcopy and electronic); dated, signed, and sealed surveyors report including certification.

## 7 Geotechnical Design

### 7.1 General

The Design-Build (DB) Contractor shall conduct all Work necessary to complete the geotechnical investigation and design for the Project. Elements of the Work shall include, but are not limited to, the following:

1. The DB Contractor shall review the existing geotechnical information, which includes the Geotechnical Data Report (GDR) provided in Volume II, Book III – Contract Data and Reports. The DB Contractor shall form its own interpretation of the existing geotechnical data and satisfy itself through its own investigations as to the suitability and sufficiency of the geotechnical data, and the form and nature of the subsurface conditions.

2. The DB Contractor shall evaluate the requirements of the Work and perform geotechnical explorations, geotechnical analyses, and laboratory testing sufficient to supplement the existing data. The DB Contractor shall...
Contractor shall provide geotechnical designs and construction support in accordance with this Section and submit a Final GER.

3. The WMATA Adjacent Construction Project Manual shall be referenced only for design and construction within the zone of influence of Washington Metropolitan Area Transit Authority (WMATA) facilities. The DC Water and Sewer Authority Project Design Manual and DC Water Green Infrastructure Utility Protection Guidelines shall be referenced only for the design and construction of impacted District of Columbia (DC) Water facilities and Utilities. The CSXT Public Project Information for Construction and Improvement Projects that may Involve the Railroad shall be referenced for field work and construction adjacent to CSXT.

7.2 Performance Requirements

7.2.1 Subsurface Exploration Plan
The DB Contractor shall develop a Subsurface Exploration Plan (SEP) to supplement information provided in the GDR to meet the requirements of the Project and submit to DDOT 30 days prior to commencing geotechnical investigation.

The exploration shall be planned and conducted in accordance with DDOT Design and Engineering Manual, AASHTO LRFD Bridge Design Specifications, and AASHTO Manual on Subsurface Investigations. The DB Contractor shall determine the specific locations, frequency, and scope of the SEP.

The exploration shall be conducted in accordance with all environmental and boring permits. The DB Contractor shall refer to Section 8 of these Technical Provisions for acquiring environmental permits or modifications to existing permits needed to complete the SEP. Any borings associated with the National Park Service (NPS) require a permit, and a right of entry permit is required to enter WMATA property. The permit application process may be time-consuming; therefore, DB Contractor shall adjust the SEP schedule for any time delays because of the application process.

The SEP shall be submitted to DDOT for review and comment as shown in Table 6-1. This submittal shall include the number and depths of the proposed borings/cone penetration tests/flat plate dilatometer tests/test pits and the proposed sampling and testing necessary to meet the minimum requirements of the Project. The submittal shall also include a Maintenance of Traffic Plan in accordance with Section 22 of these Technical Provisions for investigations that are on, or adjacent to, active freeway or city streets. The DB Contractor shall secure an access permit from the appropriate agency or entity, if required. The boring location plan shall clearly show the locations of existing borings with a different symbol from the proposed borings and shall show the location of proposed structures and facilities.

At a minimum, the SEP shall include the following information:

1. Proposed exploration type, location and reporting and documentation procedures
2. Maintenance of Traffic Plan, if required
3. Site access plans and right-of-entry permits
4. Environmental considerations (spoil containment and removal) and best management practices plan
5. Schedule
6. Utility clearance procedure
7. Work zone safety and field organization procedures
8. Health and Safety Plan
9. Emergency procedures and contacts
10. Proposed laboratory testing

Soil properties shall be determined in accordance with the acceptable general engineering practice and
appropriate AASHTO and DDOT standards. Field tests shall also be conducted in accordance with appropriate AASHTO and DDOT standards.

Following completion of exploratory Work, all boring, CPT, DMT, test pit, and other exploratory locations shall be surveyed. The survey shall determine station and offset, elevation, state plane coordinates and latitude and longitude, which shall be included on the boring logs. Following drilling and laboratory Work, the DB Contractor shall retain all samples until Final Acceptance and shall provide the samples to DDOT, if requested.

7.2.2 Laboratory Testing Requirements
Laboratory testing of soil samples shall be performed in accordance with AASHTO testing procedures. Laboratories conducting geotechnical testing shall be either AASHTO accredited for the testing being performed or fulfill the requirements of AASHTO R18 for qualifying testers and calibrating/verifying of testing equipment for those tests being performed. All test results shall be included in the DB Contractor's Geotechnical Engineering Report.

7.2.3 Geotechnical Instrumentation Plan
The DB Contractor shall develop, implement, and maintain a documented Geotechnical Instrumentation Plan (GIP) to satisfy design and Quality Control (QC) requirements and WMATA [and DC Water] requirements. The GIP shall be updated as required by construction activities and submitted to DDOT 60 days prior to commencing earthwork or excavation.

The DB Contractor shall employ the services of qualified instrumentation specialist to design and install geotechnical instrumentation and provide real-time monitoring where necessary.

The DB Contractor shall coordinate with DC Water and WMATA for any special monitoring requirements in the vicinity of their Utilities and facilities. This includes, but is not limited to, the instrumentation details, survey procedure, schedule for survey, data reduction, monitoring frequency, initial readings, threshold limiting values, and contingency plan.

7.2.4 Borehole Site Cleanup
Backfilling of borings, test pits, cone penetration test (CPT) holes, and abandonment of piezometers and inclinometers shall be performed in accordance with the provisions of applicable local, state, or federal laws and regulations. Borings shall be abandoned in accordance with District Department of the Environment regulations. No borings are allowed to be backfilled using soil cuttings from the borings. The DB Contractor shall grout all test holes drilled by the DB Contractor in a manner that ensures against subsequent settlement of the backfill and holes that could be hazardous to persons, animals, or equipment.

All investigation-derived waste suspected of contamination shall be contained, tested for contaminations, and disposed of at an appropriate disposal facility based on test results.

7.2.5 Boring Logs
The boring logs shall be prepared in accordance with the requirements of the DDOT Design and Engineering Manual and AASHTO Manual on Subsurface Investigations. Logs of all field explorations shall be included in the DB Contractor's Geotechnical Engineering Report (GER). The DB Contractor shall prepare the logs in gINT and shall submit the gINT file within 14 days after the GER is Approved.

7.2.6 Geotechnical Analysis
The DB Contractor shall perform geotechnical engineering and geologic analyses in accordance with the requirements of the Project. The geotechnical engineering and analyses shall be based on the findings from the DB Contractor's subsurface exploration and laboratory testing. The recommendations of the Technical Provisions
Geotechnical Consultant shall be contained in a Geotechnical Engineering Report.

7.2.7 Geotechnical Engineering Reports

The DB Contractor shall prepare Geotechnical Engineering Reports in accordance with all applicable Standards and this Section. Geotechnical Engineering Reports shall at a minimum include but not be limited to the following:

1. Description of site and project
2. Review of the geologic setting
3. Review of the preliminary and historical geotechnical information
4. Results of the additional subsurface exploration program which includes and not limited to the field testing, laboratory testing, borings logs, soil profiles, and pavement cores information
5. Engineering Analyses and Recommendations for the retaining walls, fill and cut slopes, minor structures, drainage facilities, and pavement design. The analyses should demonstrate that the project design and performance requirements have been met.
6. Details and recommendations to comply with WMATA and DC Water requirements
7. Dewatering recommendations
8. Construction Considerations
9. Quality control, assurance (QC/QA) and Instrumentation and monitoring requirements

Final versions of the DB Contractor's Geotechnical Report (after addressing DDOT comments) shall be stamped, dated, and signed by a Professional Engineer licensed in District of Columbia.

7.3 Design Requirements

Geotechnical design including, but not limited to, foundation and ground improvement design shall be coordinated and Approved by the Utility owners for Work in conflict with existing Utilities. The design and construction shall consider the impact of contamination as discussed in Section 8 of these Technical Provisions and shall comply with Section 13 of these Technical Provisions.

7.3.1 Wall Design

All retaining walls and wall foundations shall be designed using the AASHTO LRFD Bridge Design Specifications, the AASHTO Guide Specifications for LRFD Seismic Bridge Design, and DDOT Design and Engineering Manual.

The DB Contractor shall meet the landscape and aesthetic requirements described in Section 15 and Section 13 of these Technical Provisions.

7.3.2 Settlement of Embankment and Pavement Subgrade

Design and construction of pavement subgrade and embankments shall meet the following post-construction settlement tolerances:

1. Total vertical post-construction settlement (including immediate, primary consolidation and secondary compression settlement) shall be less than 2.0 inches.
2. Settlement that will not impede positive drainage of the pavement surface nor subject the trail to flooding in areas where it is applicable.
3. Settlement does not result in damage to adjacent or underlying structures, including Utilities.
4. Settlement monitoring including settlement plates and surface monuments (settlement points) shall be included to verify estimated results versus actual performance.

5. Humps, depressions, and irregularities exceeding the specified tolerance will be subject to correction by the DB Contractor. The DB Contractor shall notify the Quality Assurance Manager (QAM) and DDOT for any non-conformance items.

7.3.3 Slope Stability
All cut and fill slopes shall be designed to be stable for interim construction stages, at the end of construction and for design-life conditions. Soil cut slopes and fill slopes shall be designed to satisfy the following criteria:

1. The maximum slope ratio to be used for cut and fill slopes shall not be steeper than 2H:1V unless reinforced with soil nails or geosynthetics; and

2. The stability of the slopes shall meet the requirements specified in the AASHTO LRFD Bridge Design Specifications.

7.3.4 Best Management Practice
Unless geogrid is used in the MSE, no drainage or Best Management Practice (BMP) drainage facilities collecting surface water with potential deicing chemicals that may corrode mechanically stabilized earth (MSE) wall metal reinforcing strips shall be located within 75 feet from the MSE wall reinforced zone, except where the BMP is located at the bottom elevation of the MSE wall.

Where drainage or BMP facilities are located within 200 feet of an MSE wall reinforced zone, the drainage or BMP facilities shall be encapsulated with an impermeable liner of at least 2-foot thickness and permeability coefficient less than 1x10^{-3} centimeters per second (cm/second) in accordance with American Society for Testing and Materials (ASTM) D 5084 and meeting embankment fill requirements.

Seepage force and hydrostatic pressure shall be considered in slope-stability evaluation where BMPs are located on top or near the crest of cut/fill slopes or where seepage water may saturate and soften cut/fill slopes. If the slope consists of fine-grained soils, fully softening shear strength parameters shall be used for the slope-stability evaluation.

Water pressures shall be considered in the design of retaining walls or structures considering the location of BMP or drainage facilities where appropriate.

7.3.5 Utilities
There are numerous existing Utilities located within the Project Limits. All Utilities shall be relocated or protected in place as described in Section 10 of these Technical Provisions.

7.3.5.1 WMATA
Any work adjacent to or over the existing WMATA property shall be in accordance with WMATA Adjacent Construction Project Manual. Under no circumstances shall any work damage WMATA facilities. The DB Contractor shall coordinate the design and construction with WMATA and obtain Approval from WMATA before any construction activities within the zone of influence of WMATA facilities, as defined in the WMATA Adjacent Construction Project Manual.

7.3.5.2 National Park Service
DB Contractor shall coordinate all necessary sub-surface or ground disturbance work related to Geotechnical in accordance with the Special Use permit the DB Contractor is responsible for obtaining from NPS.
7.4 Construction Requirements

7.4.1 Slope Stability and Protection
The DB Contractor is responsible for slope stability throughout the Project, both within and adjacent to the ROW.

If any unstable slope or ground develops as a result of construction activities, the DB Contractor shall cease all activities in the immediate area within and around the unstable ground until the situation is fully assessed by the DB Contractor. The DB Contractor shall immediately contact DDOT informing them of the situation.

Before the DB Contractor returns to Work in the immediate area of unstable ground, the DB Contractor shall implement temporary slope stabilization measures to ensure the safety of the public and the DB Contractor's personnel.

Permanent slope stabilization measures shall be designed and constructed by the DB Contractor. DDOT will review and comment on the temporary and permanent slope stabilization measures.

7.4.2 Contaminated Soils/Groundwater
The construction shall consider the impact of contaminated soils and groundwater as specified in Section 8 of these Technical Provisions. The construction of deep foundations and ground improvement shall not cause cross-contamination (that is, contaminating the deeper, uncontaminated soil or ground water).

7.5 Submittals
In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

7.5.1 Summary of Submittals

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<td>Subsurface Exploration Plan</td>
<td>Review and Comment</td>
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<td>7.2.4</td>
<td>Geotechnical Instrumentation Plan</td>
<td>Submit</td>
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<td>3</td>
<td>7.2.8</td>
<td>Geotechnical Reports</td>
<td>Review and Comment</td>
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8 Environmental

8.1 General
Unless expressly stated otherwise in the Design-Build Contract or these Technical provisions, the DB Contractor shall conduct all Work necessary to deliver the Project while maintaining existing and necessary environmental and community commitments and further enhancing the environment and community where possible. A summary of these elements that shall be conducted by the DB Contractor includes the
following activities:

- Maintain existing environmental or community commitments as defined in the DB Contract, and any other permits, Approvals, or agreements attained as required for the Project.
- Identify new opportunities to enhance the environment or further reduce or avoid environmental or community impacts as the engineering design is completed.
- Communicate to the District Department of Transportation (DDOT) any changes in the design that may increase or decrease the environmental or community impacts or commitments beyond what has been disclosed in the documents described above.
- Foster good relationships with federal, District, local agencies, and Stakeholders by conducting a comprehensive and transparent public outreach program and ensuring that the commitments DDOT has made are reflected in the Project’s final design and are fulfilled during construction.
- Comply with all federal and District laws, regulations, policies, and ordinances.

The above items are a summary only and should not be taken as a comprehensive listing of the environmental and community commitments which are the responsibility of the DB Contractor.

8.2 Performance Requirements

8.2.1 Documentation and Approval

The DB Contractor shall prepare and implement an Environmental Management Plan (EMP) that identifies the required environmental commitments, timeframe for compliance, roles and responsibilities of Key Personnel, procedures for environmental compliance, procedures to identify and correct non-compliance events, and procedures for emergency response. DDOT’s goal is to ensure environmental compliance and no permit violations.

The DB Contractor shall provide DDOT with a complete Draft EMP prior to, or concurrent with, the first Preliminary Design Submittal for review and Comment. The Environmental Compliance Manager (ECM) shall be responsible for submitting the Draft EMP.

The DB Contractor shall provide DDOT with the Final EMP a minimum of 60 Calendar Days prior to the commencement of any construction activities.

The EMP shall consist of three parts:

1. Part I: Environmental Commitments
2. Part II: Environmental Personnel, Communications, and Training
3. Part III: Environmental Plans and Compliance Strategies

The Final EMP shall be stored in an electronic format and location easily accessible by DDOT. A hard copy of the EMP shall be maintained by the ECM at the DB Contractor’s construction office or on-site at the Project. The EMP shall be reviewed and updated throughout the Project to reflect changes in design or planned/executed means and methods for Project delivery. The EMP review and update shall be in Track Change (or comparable) mode so a revision history is readily accessible. All proposed updates to the EMP shall be submitted to DDOT for review and Approval.

8.2.2 Environmental Commitments

The EMP shall clearly identify all of the environmental and community commitments for the Project. This will, at a minimum, include items from any permits, Approvals, or agreements attained or necessary for the Technical Provisions.
Project.

For each of the items listed above, a copy of the original document shall be attached to the EMP and included with the DDOT-accessible electronic copy of the EMP.

A matrix shall be developed that clearly describes all of the environmental commitments, who will be responsible for implementing each one, when they should be initiated and completed, who will be responsible for ensuring it is completed, what agency or entity requires Approval of the Work, and the date it was completed and Approved. A hardcopy updated version of the matrix, dated and with all the revisions since the previous version clearly highlighted, shall be provided to DDOT not less than biweekly.

8.2.3 Environmental Personnel, Communications, and Training

8.2.3.1 Environmental Compliance Manager

The Environmental Compliance Manager (ECM) shall be responsible for the overall environmental compliance for the Project and shall function as principal technical advisor and coordinator for environmental issues for the Project. The ECM shall report directly to the Design-Build Project Manager and shall have the authority to stop Work which is not being performed in accordance with the EMP. The EMP shall identify all critical roles, responsibilities, and authorities of the ECM. The EMP shall identify the roles and responsibilities of other staff and their roles in ensuring environmental compliance for the Project.

The ECM shall be onsite full time for the duration of the Project. If the DB Contractor replaces the ECM, the DB Contractor shall provide an equally or more qualified replacement, contingent upon DDOT’s Approval. If during the course of the Contract DDOT finds that the ECM is not ensuring full environmental compliance with all permits, provisions, policies, and commitments, DDOT may require the replacement of the ECM.

The ECM must have at least five years of experience managing environmental compliance on active construction projects. At least three of those five years must be specific to transportation projects. The ECM must have knowledge of and experience with the environmental regulations and permits relevant to the Project, a good understanding of heavy construction techniques and issues of engineering design, and the experience and ability to read engineering plans. DDOT shall Approve the person proposed to be the ECM by the DB Contractor.

If the DB Contractor chooses to have a Deputy ECM, that person shall have the same qualifications and DDOT Approval requirements as the ECM. The ECM shall also be responsible for the following:

1. Integrating with the design team during plan preparation and advising on avoiding and minimizing adverse effects to the natural environment and communities through design and construction means and methods.

2. Reviewing all engineering plans to ensure the Project’s design accurately reflects environmental commitments and requirements.

3. Ensuring and providing documentation to DDOT that the design and construction activities comply with all environmental commitments agreed to in the environmental documents, permits, agreements, and Approvals of the Project.

4. Acting as a liaison to DDOT, regulatory agencies, the design team, and the construction personnel (e.g., submitting reports, discussing changes to the Project, communicating compliance issues, and discussing non-compliance events).

5. Having the authority and means to bring the Project into compliance and/or stop Work if the Project is in violation of an environmental regulation or commitment.

documents.

7. Preparing or providing direct supervision to individuals assigned to prepare and implement the plans described in Section 8.2.4

8. Identifying when a non-compliance event is occurring, or has occurred, and communicating that immediately to DDOT.

9. Attending field visits conducted by regulatory agencies. Preparing and implementing a monitoring plan to ensure erosion/sedimentation and spill control devices and best management practices (BMPs) are effective and maintained.

10. Conducting field inspections on a weekly basis, at a minimum, and within 24 hours of each inclement weather event to ensure that environmental compliance measures and BMPs are meeting environmental requirements.

8.2.3.2 Environmental Communications Protocol
As part of the EMP, the ECM shall develop, document, and implement an Environmental Communications Protocol. The Environmental Communications Protocol shall describe the process to be used for compliance and non-compliance reporting; procedures for internal and external communications; and communications with DDOT.

The Environmental Communications Protocol shall include organizational charts that identify the DB Contractor’s ECM and other personnel who will be assisting the ECM to ensure compliance with all permit conditions, performance standards, and environmental commitments. It shall specify environmental personnel roles and communication procedures that will be used for internal and external communications and communications with DDOT. In the event of changes to listed staff, the Environmental Communications Protocol shall be updated by the DB Contractor with current staff and contact information. Staff and process changes must be submitted to and Approved by DDOT.

8.2.3.3 Monthly Environmental Coordination Meetings
The DB Contractor’s ECM shall organize and implement monthly meetings conducted with DDOT during design and construction to ensure that the Project design meets the Project environmental commitments and to identify which construction elements such as locations, Work activities, weather conditions, and times of day present the greatest risk to the environment. The ECM shall prepare and distribute a written agenda at least two Business Days before each scheduled meeting. The environmental compliance matrix shall be a topic on the meeting agenda and comments shall be included in the meeting minutes. The frequency of these meetings may be increased to address specific issues within a particular timeframe.

DDOT shall be invited to attend these meetings. The ECM shall use the Commitments List and the construction schedules to identify environmental commitments pertaining to upcoming Work activities. The ECM shall verify that environmental commitments are implemented. When commitments are implemented, the EMP shall be updated to communicate the completion of an activity to DDOT.

8.2.3.4 Environmental Pre-Construction Meeting
The DB Contractor shall organize and lead an environmental pre-construction meeting with DDOT and the regulatory agencies a minimum of 60 Calendar Days prior to the planned start of construction. During the environmental pre-construction meeting, the DB Contractor shall discuss the EMP, including its environmental protection training program, to demonstrate how the DB Contractor shall meet permit requirements and fulfill environmental commitments. The DB Contractor Key Personnel shall have read each of the signed permits required to complete this Project and review each permit with the agency representatives attending the pre-construction meeting. The DB Contractor shall discuss its construction schedule and identify the early construction elements.
8.2.3.5 Environmental Protection Training

The DB Contractor shall develop and implement an environmental protection training program for the DB Contractor’s design and construction staff, quality control and quality assurance personnel, Subcontractors, and vendors. The DB Contractor shall be responsible for all Work, including Subcontracted and supplied Work, and associated personnel should their Work practices lead to a negative effect on the environment or result in a non-compliance event or permit violation. Therefore, the DB Contractor’s training program shall orient employees, Subcontractors, and all other parties brought onto the Project to complete Work in support of the Project to the following activities prior to the start of Work:

- Permit conditions, performance standards, environmental commitments, and environmental regulations related to the Project.
- Overall importance of environmental issues.
- Specific environmental sensitivities of the Project.
- Erosion and sediment control procedures and certification.
- Environmental compliance monitoring and reporting procedures.
- Management of known or suspected contamination.
- Unanticipated historic or archaeological discoveries or discovery of potential human remains.
- Discovery of hazardous materials including unexploded ordinance.
- Emergency response procedures.

The DB Contractor’s ECM shall notify DDOT of environmental training sessions and invite DDOT to participate.

The DB Contractor shall provide training to those conducting water quality monitoring to ensure that monitoring is conducted in accordance with the District of Columbia Municipal Regulations (DCMR) (Title 21, Chapter 19, Water Quality Monitoring Regulations) protocols, Project-specific permit conditions, performance standards, and environmental commitments. This training shall include a field visit with DDOT environmental staff prior to construction to establish monitoring sites and to review monitoring and reporting procedures.

8.2.4 Environmental Plans and Strategies

8.2.4.1 Erosion and Sediment Control Plan

DDOT has adopted the D.C. Department of Health, Environmental Health Administration, Bureau of Environmental Quality Watershed Protection Division Stormwater Management Guidebook and Standards and Specifications for Soil Erosion and Sediment Control. All Work shall be performed in strict conformance with the requirements specified in the above referenced manuals, of Best Management Practices, and of Sections I (Temporary Structural Practices), and II (Permanent Structural Practices) as applicable of the DCRA Standards and Specifications, and in accordance with the erosion control regulations in the current Title 21 of the D.C. Municipal Regulations (DCMR 21, Chapter 5).

The DB Contractor shall prepare and implement an Erosion and Sediment Control (ESC) Plan that describes measures to minimize and contain erosion during construction activities. The DB Contractor shall identify a certified ESC Lead who shall develop, implement, inspect and update the ESC Plan. The ESC Plan shall be modified to reflect field-implemented changes and shall be kept up to date in the field office of the Project.

The ESC Plan (narrative and plan sheets) shall be prepared and implemented in accordance with DOEE’s Standards and Specifications for Soil Erosion & Sediment Control and Section 618 of DDOT Standard Specifications for Highways and Structures. The Plan will also address offsite stormwater in accordance with Technical Provisions.
the DDOT Standard Specifications. The DB Contractor’s ESC Plan shall accommodate all Project-specific permit conditions, performance standards, and environmental commitments. The DB Contractor shall develop and implement a Project-specific Stormwater Management Plan (SMP) as part of the ESC Plan since some designed Stormwater management facilities can be used as temporary ESC facilities and then converted back to permanent SWM structures. The Stormwater Management Plan shall address the minimum requirements identified in DOEE’s Stormwater Management Guidebook. At a minimum, the General Retention Compliance Calculator will be used to prepare the Stormwater Management Plan that is required as part of the permit process for regulated construction and redevelopment sites. The Stormwater Retention Credit (SRC) Calculator should be used to calculate the eligible retention capacity of any site that is applying to generate SRCs. The ESC Plan and the SWM plan shall be submitted to DDOT and DOEE for review and Approval a minimum of 60 Calendar Days prior to the commencement of planned construction activities.

The DB Contractor shall submit an ESC Plan to DDOT that addresses early construction elements as a part of the Preliminary Design Submittal. Updated ESC Plans, including a narrative and plan sheets, shall be submitted as part of the Final Design Submittal. Construction shall not proceed on any element of Work until the relevant ESC Plans, including narratives, are stamped “Released for Construction” and permit has been issued by the DOEE.

**Erosion and Sediment Control Maintenance**

The DB Contractor shall select, install, monitor, and maintain all erosion and sediment control BMPs. The DB Contractor shall ensure sediment controls remain in effective operating condition and are protected from activities that reduce their effectiveness during permit coverage. The DB Contractor shall not use experimental BMPs unless they have been Approved by DDOT prior to their use (e.g., chemically enhanced sand filtration systems). Monitoring activities and inspection protocols shall be described in the DB Contractor’s EMP. Failure to install and/or repair ESC Plan measures will result in Project Work stoppage until environmental compliance is achieved.

The DB Contractor shall remove all temporary BMPs from the Right-of-Way (ROW), in accordance with Section 618 of the Standard Specifications for Highways and Structures and the Project-specific permit requirements.

**8.2.4.2 Spill Prevention, Control, and Countermeasures Plan**

The DB Contractor shall prepare a Project-specific Spill Prevention, Control, and Countermeasures (SPCC) Plan that will be used for the duration of the Project. The DB Contractor shall submit the Plan to DDOT as part of the EMP, in accordance with the requirements described in this Section. No onsite construction activities, including placing materials or equipment in staging or storage areas, may commence until DDOT has reviewed and Approved the SPCC Plan for the Project.

The term “hazardous materials” as used in these Technical Provisions, is defined in Chapter 16 of the DDOT Environmental Manual. Occupational safety and health requirements may pertain to SPCC Plan implementation.

**Implementation Requirements**

The SPCC Plan shall be kept up to date by the DB Contractor throughout Project construction, and the written Plan will reflect actual site conditions and practices and will be refined as conditions change over the lifetime of the project. The DB Contractor shall update the SPCC Plan in accordance with all permit requirements and environmental commitments and maintain a copy of the updated SPCC Plan on the Project site. All Project employees shall be trained in spill prevention and containment and shall know where the SPCC Plan and spill response kits are located and have immediate access to them.
If hazardous materials are encountered or spilled during construction, the DB Contractor shall control and contain the material, as safety permits and until appropriate mitigation measures can be taken. The DB Contractor shall supply and maintain spill response kits of appropriate size for the Work being performed and materials being handled within close proximity to hazardous materials and equipment to allow a response within 10 minutes of the spill detection.

**SPCC Plan Element Requirements**

The SPCC Plan shall contain all necessary information for managing accidental hazardous material spills and unanticipated discoveries of prior contamination. The SPCC Plan shall set forth the following information:

1. **Responsible Personnel** – Identify the name(s), title(s), and contact information for the personnel responsible for implementing and updating the Plan, including all spill responders.

2. **Spill Reporting** – List the names, telephone numbers, email addresses, and mailing addresses of the federal, District, and local agencies to be notified in the event of a spill.

3. **Project Site Information** – Describe the following items:
   a. Project Work
   b. Site location and boundaries
   c. Drainage pathways from the site
   d. Nearby waterways and sensitive areas and their distances from the site

4. **Potential Spill Sources** – Describe each of the following for all potentially hazardous materials brought or generated on-site (including materials used for equipment operation, refueling, maintenance, or cleaning):
   a. Name of material and its intended use
   b. Estimated maximum amount onsite at any one time
   c. Location(s) (including any equipment used below the ordinary high water line) where the material will be staged, used, and stored and the distance(s) from nearby waterways and sensitive areas
   d. Decontamination location and procedure for equipment that comes into contact with the material
   e. Disposal procedures
   f. Pre-existing contamination
   g. Any pre-existing contamination and contaminant sources (such as buried pipes or tanks) in the Project area that are described in the Contract Documents
   h. Equipment and work practices that will be used to prevent the release of contamination

5. **Spill Prevention and Response Training** – Describe how and when all personnel (including refueling contractors and Subcontractors) will be trained in spill prevention, containment and response in accordance with the Plan. Describe how and when all spill responders will be trained.

6. **Spill Prevention** – Describe the following items:
   a. Spill response kit contents and location(s)
b. Security measures for potential spill sources

c. Secondary containment practices and structures for hazardous materials storage

d. Methods used to prevent stormwater from contacting hazardous materials

e. Site inspection procedures and frequency

f. Equipment and structure maintenance practices

g. Daily inspection and cleanup procedures that ensure all equipment used below the ordinary high water line is free of all external petroleum-based products

h. Refueling procedures for equipment that cannot be moved from below the ordinary high water line

7. Spill Response – Outline the response procedures the DB Contractor will follow for a spill of each contaminant identified to be within the Project Limits.

8. Project Site Map – Provide a map showing the locations of the following items:

   a. Site location and boundaries

   b. Site access roads

   c. Drainage pathways from the site

   d. Nearby waterways and sensitive areas

   e. Hazardous materials, equipment, and decontamination areas

   f. Pre-existing contamination or contaminant sources

   g. Spill prevention and response equipment

9. Spill Report Forms – Provide a copy of the Spill Report form(s) that the DB Contractor will use in the event of a release or spill.

8.2.4.3 Air Quality and Fugitive Dust Control Plan

Fugitive dust shall be controlled by the DB Contractor in accordance with the DCR, Section 605 Control of Fugitive Dust (D.C. Law 5-165, § 605, 32 DCR 565, 610) and Project-specific commitments. The DB Contractor shall prepare and implement a Fugitive Dust Control Plan to reduce short-term construction impacts to air quality and submit it to DDOT for review and comment as part of the EMP. The Fugitive Dust Control Plan shall include provisions for reducing nuisance dust levels from travelling offsite and impacting the surrounding community. The DB Contractor shall ensure that all air quality and fugitive dust requirements in the permits or other environmental documentation are incorporated into the Air Quality and Fugitive Dust Control Plan to control particulate matter.

8.2.4.4 Concrete Containment, Collection and Disposal Plan

The DB Contractor shall prepare a Concrete Containment, Collection and Disposal Plan (CCDP) to minimize potential for adverse environmental effects associated with Project-related concrete Work and submit it to DDOT for review and Approval as part of the EMP. The Plan shall include, at a minimum, a description of all concrete-related activities and associated BMPs anticipated for use on this Project. The DB Contractor shall ensure that all concrete-related requirements in the permits or other environmental documentation are incorporated into the CCDP.

8.2.4.5 Environmental Compliance, Monitoring, and Reporting

The DB Contractor, through rigorous monitoring and inspection, shall ensure that all regulations, Approvals, and environmental performance specifications are being fulfilled. These monitoring and inspection processes will be presented in the EMP. At a minimum, the DB Contractor’s process for monitoring
environmental compliance and reporting shall be provided.

In addition, within 30 Calendar Days of Final Completion, the ECM shall conduct final monitoring inspections to assess and document compliance with permitting requirements and other environmental commitments provided to the DB Contractor in the Commitments List. Inspections should address the successes, failures, and remedial actions for site restoration.

8.2.4.6 Environmental Commitment Close-Out Report
The DB Contractor shall prepare an Environmental Commitment Close-Out Report to summarize overall compliance with permit conditions, performance standards, and environmental commitments. At a minimum, the DB Contractor’s Environmental Commitment Close-Out Report shall include the following:

1. Fulfillment descriptions completed for all permit conditions, performance standards, and environmental commitments.
2. Commitments the DB Contractor was required to change and how it was fulfilled.
3. Commitments the DB Contractor was unable to fulfill and why.
4. Significant compliance deficiencies or incidents that may have occurred during the life of the Project and the corrective actions taken.
5. Future requirements for maintaining permanent BMPs, such as cleaning detention ponds.

The Environmental Commitment Close-Out Report shall be submitted for review within 30 Calendar Days of Final Completion.

8.3 Design Requirements

Not used.

8.4 Construction Requirements

8.4.1 Permits and Approvals
Based on coordination with the regulatory agencies that has already occurred, DDOT has compiled a draft Permit and Approval List (Table 8-1) anticipated to be required for the Project. This list (Table 8-1) is not intended to be a comprehensive list of permits which may be required. Identifying and acquiring any additional permits required beyond this list are the sole responsibility of the DB Contractor. Some of the permits will be acquired by DDOT (schedule not determined) and others by the DB Contractor as outlined below. These permits and Approvals are expected to contain additional conditions and commitments beyond those documented in the EA and the FONSI. These additional commitments shall also be included in the EMP and shall be required to be implemented by the DB Contractor. In the event that the Technical Proposal no longer meets the commitments set forth in the Approved environmental documentation for the Project (EA, FONSI, permits or other Approvals), additional or revised environmental compliance activities (NEPA documentation, amended permits or Approvals) may be required to be attained by the DB Contractor prior to construction.

<table>
<thead>
<tr>
<th>Permit (Authorizing Agency)</th>
<th>Permittee</th>
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<tr>
<td>Construction General Permit including Stormwater Pollution Prevention Plan (SWPPP) (USEPA)</td>
<td>DB Contractor</td>
</tr>
<tr>
<td>Noise Variance (if needed)</td>
<td>DB Contractor</td>
</tr>
<tr>
<td>Other Permits as Required (ESC, SWM, Floodplain Management, etc.)</td>
<td>DB Contractor</td>
</tr>
<tr>
<td>WMATA Real Estate Permit (WMATA)</td>
<td>DB Contractor</td>
</tr>
</tbody>
</table>

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The DB Contractor shall follow the requirements of all permits obtained and necessary for the Project. The DB Contractor shall provide DDOT with timely notice of its intent to propose an alternative construction method or a design change that is inconsistent with a particular permit, environmental requirement, or commitment. DDOT will work with the DB Contractor to bring final detailed proposals (provided by the DB Contractor) to the regulatory agencies for permit modifications to obtain new permits or Approvals as required. The DB Contractor shall be responsible for preparing any additional data and/or environmental documentation needed to modify or attain environmental Approvals required for implementation of the DB Contractor’s alternative proposal. Depending on the nature of the design change, some or all of the environmental may need to be revised prior to implementing the proposed change.

All costs and/or delays of any kind that result from the discovery of a previously unknown sensitive resource (e.g., streams, wetlands, archaeological resources) that is located outside of the proposed Work area for the Project as shown in the Conceptual Plans shall be the DB Contractor’s responsibility.

### 8.4.2 Other Agreements and Commitments

The environmental documents provided in Volume II, Book III, Contract Data and Reports, contain commitments for the completion of the Work. The DB Contractor shall ensure that these commitments are adhered to and implemented.

#### 8.4.2.1 Construction Noise

The DB Contractor shall implement mitigation measures for temporary noise impacts associated with construction activities in accordance with the commitments in the EA and FONSI, as well as local requirements.

#### 8.4.2.2 Tree Preservation

The DB Contractor shall make all reasonable efforts to preserve trees within the Project area. No trees greater than 6 inches diameter at breast height (DBH) may be removed for illumination, signage, or utility cabinets, without prior Approval from DDOT. Special care shall be taken during excavations near existing trees to avoid unnecessary damage. Necessary limb and root pruning shall be conducted by the project arborist prior to construction activities.

The DC Urban Forest Preservation Act and Special Tree Removal Permit regulations (DCMR 24-3700) restrict the removal of trees with diameters of 17.5 inches or greater. The DC Urban Forest Preservation Act requires a Special Tree Removal Permit for a person or nongovernmental agency that removes trees with a circumference of 55 inches (17.5 inches diameter) or more.

### 8.5 Submittals

The DB Contractor shall provide copies of all environmental correspondence, whether email or hard copy, and/or all documents to or from agencies, stakeholders, property owners, or other interested parties to DDOT as it occurs.

In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.
8.5.2 Summary of Submittals

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
<th>Submittal</th>
<th>DDOT Review Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.2</td>
<td>Draft Environmental Management Plan</td>
<td>Review and Comment</td>
</tr>
<tr>
<td>2</td>
<td>8.2</td>
<td>Final Environmental Management Plan</td>
<td>Review and Approval</td>
</tr>
<tr>
<td>3</td>
<td>8.2</td>
<td>Erosion and Sediment Control Plan</td>
<td>Review and Approval</td>
</tr>
<tr>
<td>4</td>
<td>8.2</td>
<td>Contaminated Water Management Plan</td>
<td>Review and Comment</td>
</tr>
<tr>
<td>5</td>
<td>8.2</td>
<td>Environmental Commitments Close-Out Report</td>
<td>Review and Comment</td>
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<tr>
<td>6</td>
<td>8.4</td>
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<tr>
<td>7</td>
<td>8.5</td>
<td>Copies of Noise Variances</td>
<td>Submit</td>
</tr>
<tr>
<td>8</td>
<td>8.5</td>
<td>Copies of all environmental correspondence whether email or hard copy and/or documents to or from agencies, Stakeholders, property owners, or other interested parties</td>
<td>Submit</td>
</tr>
</tbody>
</table>

9 Public Information and Outreach

9.1 General
The DB Contractor will provide information related to design, maintenance of traffic, construction and all supporting, plans, and CADD files as needed to assist DDOT in their efforts to develop and maintain a consistent level of public communication that encourages broad public awareness and understanding of the Project.

All public information and communications materials shall meet ADA requirements.

9.2 Performance Requirements
DB Contractor shall provide daily, on-going support to DDOT in the implementation of a communication and public outreach plan. DB Contractor shall support DDOT’s outreach and marketing activities by providing necessary materials and information for use in outreach efforts; such materials may include a graphical project overview, plan of work for the coming month, overall project schedule, and update Project photos.

DB Contractor shall be required to participate in DDOT organized public forums, providing outreach and technical staff as necessary.
10 Utilities

The DB Contractor shall provide Utility coordination for the Project and conduct all Utility Work in accordance with the Contract Documents.

10.1 General

DB Contractor shall coordinate directly with all Utility owners to identify and confirm Utility locations, potential conflicts and relocations necessary for the Project. The DB Contractor shall be responsible for obtaining any additional utility data it deems necessary for design and construction of the project.

DB Contractor’s obligation to coordinate Utilities is applicable to all Utilities impacted by the Project, whether or not:

- DDOT has had previous discussions with Utility Owner; and
- DDOT has identified the existing Utility on a Utility composite map

DB Contractor shall perform all Utility Work necessary for the Project including at a minimum protection, adjustment, or relocation due to:

- a physical conflict between the Utility and the Project that cannot be avoided;
- an incompatibility between the Utility and the Project based on DDOT, WMATA, or CSXT requirements

The DB Contractor shall conduct alternative studies to avoid relocation of utilities if at all possible.

Subsurface utility engineering quality level B - utility designating has been completed and included in Volume II, Book IV - Contract Drawings and Volume II - Contract Data and Reports. Inaccuracies in information regarding the locations of an underground utility based on utility designation information shall be considered material only if the utility’s actual centerline location is more than three (3) feet distant from the horizontal centerline location shown on the Book IV Contract Drawings, without regard to vertical location.

10.2 Performance Requirements

The DB Contractor is responsible for avoiding, protecting, and coordinating Utilities as necessary to maintain service, safety, and project schedule with minimal disruption to the traveling public or utility customers.

10.3 Design Requirements

All utilities within the Limits of Disturbance shall be analyzed and/or designed to support all dead and live loads, including, at a minimum, that imposed by earth, sub-base, ballast, pavement, and structures when the Utility is operating under internal pressure ranges varying from zero to maximum.

10.3.1 Utility Relocations by Others

Pepco maintains aerial facilities located within the limits of this Project that have found to be in conflict with DDOT’s preliminary design. It is the responsibility of the DB Contractor to coordinate Pepco’s relocation with the DB Contractor’s design, schedule, and sequence of construction so that there are no delays to the utility relocations or DDOT’s project.

If the DB Contractor impacts Pepco’s relocated facilities, the cost of the redesign and relocation shall be 100% the DB Contractor’s responsibility.
10.3.2 Utility Relocations by the DB Contractor

The DB Contractor shall obtain all required utility permits from DDOT and all necessary Government Approvals with regard to utility work that it performs including service connections.

Storm sewer connections and adjustments shall be performed by DB Contractor.

Other utilities shall be protected in place or avoided. No other utility impacts are anticipated for this Project. If the DB Contractor’s design impacts a Utility, all costs associated with the relocation shall be the DB Contractor’s responsibility.

10.3.3 DB Contractor Utility Plans

DB Contractor shall submit preliminary and final utility design plans for utilities to be relocated by the DB Contractor for review and comment if necessary.

10.4 Construction Requirements

DB Contractor shall permit, furnish, install, inspect, and coordinate the construction of the utility facility in accordance with the requirements of the Contract Documents.

DB Contractor shall be responsible for any interruptions of service including coordinating all utility service interruptions with the appropriate utility company and be responsible for ensuring that such interruptions are minimized.

DB Contractor shall be responsible for ensuring the abandonment or removal of utilities within the Limits of Disturbance.

10.5 Submittals

10.5.1 Summary of Submittals

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
<th>Submittal</th>
<th>DDOT Review Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.3</td>
<td>Preliminary Utility Relocation Plans</td>
<td>Review and Comment</td>
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<tr>
<td>2</td>
<td>10.3</td>
<td>Final Utility Relocation Plans</td>
<td>Review and Comment</td>
</tr>
</tbody>
</table>
11 Civil and Trail Design

11.1 General
The DB Contractor shall conduct all Work necessary to complete the civil design elements for the Project and meet the requirements as set forth herein.

This section identifies requirements for trails, sidewalks, trail connections, fencing and other civil design elements.

11.2 Performance Requirements
The DB Contractor shall provide a new highly functional, safe, and sustainable trail facility to meet the Project Goals for the Project.

Trail horizontal and vertical alignments shall be smooth, avoiding kinks and breaks.

11.3 Design Requirements
The DB Contractor shall provide all civil and trail elements in accordance with Mandatory Standards listed in Section 2 of these Technical Provisions to meet the Project Goals for the Project.

No Work shall extend beyond the limits of disturbance unless as described in Section 24 of these Technical Provisions.

11.3.1 Trail
DB Contractor shall provide new trail and replace existing trail within the limits of disturbance shown on the Volume II, Book IV Contract Drawings and in accordance with the Mandatory Standards listed in Section 3 of these Special Provisions.

- DB Contractor shall provide a new trail from 1500 feet south of Bates Road NE along John McCormack Drive NE to First Street NE at the Fort Totten Metro Station as shown on the Volume II, Book IV Contract Drawings.

- DB Contractor shall replace existing trail from First Street NE to Gallatin Street NE as shown on the Volume II, Book IV Contract Drawings.

11.3.1.1 Geometry
Trail alignments shall meet DDOT, AASHTO, and ADA Standards with a minimum 20-mph design speed for horizontal and vertical alignments and horizontal sight distance except at the following locations are where the prescribed design requires a reduced design speed.

- Horizontal curve at the crest of the trail over the WMATA Green Line Portal may meet a minimum 15-mph design speed.

- Horizontal curve in the vicinity of Sta. 117+50 on the alignment shown in the Volume III Contract Drawings may meet a minimum 15-mph design speed.

DB Contractor shall design trail alignments in accordance with all requirements of the Contract Documents and to be within the following ranges of the trail alignments shown in Volume II, Book IV Contract Drawings.

- Range of five feet left and right of the horizontal alignments shown on the Volume II, Book IV Contract Drawings.
Trail vertical alignments shall have a minimum of 0.5% grade and maximum of 5.0% grade except within vertical curves. DB Contractor shall provide adequate stopping sight distance for crest vertical curves according to the AASHTO Guide for Development of Bicycle Facilities, 4th Edition.

11.3.1.2 Typical Section

The Metropolitan Branch Trail shall be designed with a minimum paved width of 10 feet, except where shoulders adjacent to the trail are not provided, the minimum paved width of the trail shall be 12 feet. Trail sections in constrained locations between back of curb and retaining walls or fences shall be paved the entire width with the trail paving as specified in Section 20 of these Technical Provisions.

Shoulders shall be provided along the entire length of the trail alignments, except that they may be omitted when the trail is located within a 5-foot offset from the existing CSXT easement. Shoulders shall be a minimum of 2-foot in width. Shoulder widths next to steep slopes or obstructions should be provided according to AASHTO Guide for Development of Bicycle Facilities, 4th Edition.

Exhibit 1.1

<table>
<thead>
<tr>
<th>Trail Connection Name</th>
<th>From</th>
<th>To</th>
<th>Ramp Connection</th>
<th>Stair</th>
<th>Station Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Totten Stair Access</td>
<td>Metropolitan Branch Trail Sta. 122+40</td>
<td>Existing sidewalk along First Place NE</td>
<td></td>
<td>X</td>
<td>+/- 50 feet</td>
</tr>
<tr>
<td>Fort Totten Ramp</td>
<td>Metropolitan Branch Trail Sta. 126+50</td>
<td>Existing sidewalk along First Place NE</td>
<td>X</td>
<td></td>
<td>+/- 50 feet</td>
</tr>
</tbody>
</table>

11.3.1.3 Trail Connections
11.3.1.4 Limits of Work

DB Contractor shall identify the necessary limits of work on the trail alignment to meet the goals and requirements of the Project. At a minimum the limits of work for the trail shall be the following.

- DB Contractor shall connect proposed Metropolitan Branch Trail to existing shared use path on east side of John McCormack Drive NE near Sta. 86+63 as shown on Volume II, Book IV Contract Drawings.
- DB Contractor shall connect proposed Metropolitan Branch Trail to existing sidewalk along the west side of First Place NE near Sta. 131+00 as shown on Volume II, Book IV Contract Drawings.
- DB Contractor shall connect proposed Metropolitan Branch Trail connector to Gallatin Road NE near Sta. 208+42 as shown on Volume II, Book IV Contract Drawings.

11.3.2 Sidewalks

DB Contractor shall provide new or reconstructed sidewalks at the following locations to safely and efficiently move pedestrians to and from the Metropolitan Branch Trail to and from the Fort Totten Metro Station according to the Mandatory Standards in Section 2 of these Technical Provisions.

- **First Place NE**: Reconstruct existing sidewalk and widen sidewalk to 10’ within along the west side of First Place NE from Metropolitan Branch Trail Sta. 122+90 RT to Sta. 127+80 RT.

11.3.3 Sidewalk Curb Ramps

DB Contractor shall provide sidewalk curb ramps in accordance with the Mandatory Standards at the following locations:

- **John McCormack Road NE**: at existing crosswalk at south end of the project, east side of John McCormack Road NE
- **John McCormack Road NE**: at curve with Bates Road NE and Fort Totten Solid Waste Disposal Transfer Station, both sides of John McCormack Road NE
- **First Place NE**: at entrance to WMATA bus loop, on west side at widened sidewalk and east side on concrete plaza between Galloway Street NE and WMATA bus loop.
- **First Place NE**: at the intersection of First Place NE and the existing WMATA Park and Ride Lot Entrance reconstruct curb ramps for all three legs of the intersection.
- **Gallatin Street NE**: at the terminus of the Metropolitan Branch connector at Gallatin Street NE.

11.3.4 Barriers and Railings

Use of any type of barrier or railing shall be minimized to the extent practicable through removal of obstacles and selection of appropriate slopes. Where clear zone requirements cannot be met for the trail, the DB contractor shall provide barriers or railings in accordance with AASHTO requirements.

11.3.5 Curbs

DB Contractor shall provide PCC curbs meeting DDOT Standards along the trail where necessary to limit property impacts and control drainage.
11.3.6 Fence

DB Contractor shall replace existing barbed wire chain link fence along DCDPW Fort Totten Trash Transfer Station and Aggregate Industries properties. Chain link fence shall be replaced according to WMATA standards with a minimum height of 8 feet above the finished surface of the trail. The WMATA fence arms shall face away from the trail. Fence openings shall not exceed 2 inch by 2 inch.

11.3.7 Roadway Submittals

DB Contractor shall submit Civil and Trail Plans for Review and Comment at Preliminary and Final Design, including, at a minimum, the following elements:

- Geometry control and data sheets for trail alignments;
- Trail plan sheets – including trail design, trail connections, sidewalks, sidewalk curb ramps, curb locations, barriers and railing locations, fence reconstruction limits, and clearly defined limits of work;
- Vertical alignment sheets for the trail and trail connections;
- Typical section sheets;
- Intersection detail sheets – including curb ramp details and sidewalk stakeout charts;
- Pavement detail sheets;
- Cross sections at 50 foot even stations, at driveways, and at other critical locations; and
- Design calculations for the following trail alignment elements
  - Horizontal sight distance
  - Vertical sight distance

11.4 Construction Requirements

DB Contractor shall coordinate with WMATA and CSXT on fence replacement to avoid track fouling. Chain link fence with barbed wire shall meet WMATA Standards. Sections of security fence removed shall be replaced in the same working day, no gaps or temporary fencing shall be allowed at the end of each construction day.

11.5 Submittals

In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated within Section 1 of these Technical Provisions.

11.5.1 Summary of Submittals

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12 Project Documentation

12.1 General
The DB Contractor shall conduct all Work necessary to complete the required documentation of all Work activities for the design and construction of the Project and to obtain DDOT acceptance of the final Project documentation.

The DB Contractor shall maintain in good order, in a secure and protected place at the Project site, one record copy of all drawings, specifications, addenda, written amendments, change orders, change directives, field orders, and written interpretations and clarifications required for the Work. The DB Contractor shall annotate the record documents to show changes made during construction. The DB Contractor shall make these record documents, together with all Approved samples and Approved shop drawings, available to DDOT for reference.

The DB Contractor shall, to the maximum extent possible, utilize e-Builder® (e-Builder) as the Project Documentation platform for this Project.

In the event the DB Contractor is not able to deliver a submittal via e-Builder, the DB Contractor shall submit to DDOT two hard copies and one electronic copy on CD. Hard copies and CDs shall be labeled the same as submittals made via e-builder as required herein and in Section 28 of these Technical Provisions.

The DB Contractor shall maintain all files indicated in this Section in electronic media and hard copies which meet or exceed the documentation requirements of DDOT.

Prior to commencement of construction, an orientation meeting shall be held between the DB Contractor, DDOT and FHWA to address documentation requirements. The DB Contractor shall be responsible for obtaining, maintaining, and reviewing all documents and records for compliance with the Contract requirements.

At a minimum, the DB Contractor shall prepare and circulate to DDOT, one hard copy and one electronic copy of all correspondence, minutes of meetings, and other documents.

The DB Contractor shall develop and implement data security and a backup and recovery plan for Project information maintained by the DB Contractor.

12.1.1 Design Documentation
Throughout the course of the Project, the DB Contractor shall maintain in the DB Contractor’s construction office and make available for DDOT review, at a minimum, one complete set of the following documents:

1. Reports related to design
2. Studies and investigations
3. Released for Construction (RFC) Documents and Notice of Design Change (NDC)
4. Permits and other environmental agreements
5. Easement agreements
6. WMATA, NPS, and CSX Agreements

12.1.2 Construction Documentation
Throughout the course of the Project, the DB Contractor shall maintain in the DB Contractor’s construction office and make available for DDOT review, at a minimum, one complete set of orderly hard-copy files that include, but is not limited to the following documents:

1. Subcontracts
2. Shop drawings
3. RFC drawings
4. Field design changes
5. Backup information for changes in work/extra work
6. Calculations for mix designs
7. All submittals
8. Claims
9. Calculations
10. Reports related to construction activities
11. Project diaries
12. Test reports and all testing results
13. As-Built records/drawings

Throughout the course of the Project, the DB Contractor shall maintain in the DB Contractor’s construction office and make available for DDOT review, at a minimum, two complete full-sized sets of orderly hard-copy files that include the conformed RFC Documents.

12.1.3 Document Control Requirements

12.1.3.1. General
Document control is an integral part of DDOT’s proactive Project Management process for all DDOT projects. The DB Contractor shall ensure that all incoming and outgoing Project Documentation is electronically and physically accounted for and filed.

The Department and DB Contractor shall agree upon e-builder file naming convention, document routing, and filing, control, and retrieval methods prior to the first design submittal to DDOT and no later than 30 Calendar Days after Notice to Proceed.

DDOT will provide the DB Contractor with two e-builder licenses and e-builder training for the two persons designated by the DB Contractor to be their licensed users.

DB Contractor shall be responsible for obtaining any additional licenses and training as needed at no additional cost to DDOT.

12.1.3.2. File Format.
Graphics shall be submitted in TIF, GIF, JPG, or PDF file formats (compressed image formats only). These formats are intended for photos, conceptual sketches, and other uses.
All links between non-graphical data and graphic elements, relationships between database tables, and report formats shall be maintained. All database tables shall conform to the structure and file naming guidance provided by DDOT. The DB Contractor shall provide the database file in the preferred file format as directed by the DDOT Contract Administrator.

Any documents such as reports, photographs, and manuals that use a variety of software packages and file formats shall be submitted as PDFs (version 7.0 or later), in addition to being submitted in the base file format.

12.1.3.3. Submittals Work Plan

The DB Contractor shall submit a Document Control Work Plan within 30 Calendar Days of NTP or prior to the first design submittal, whichever occurs first. This Plan shall include the following:

1. File structure and numbering
2. Flow charts depicting the routing and processing of documents
3. Persons involved and their responsibilities
4. The handling and filing of hard-copy documents
5. Incorporation of electronic documents into the system

12.1.3.4. Format

All documents sent to DDOT shall contain the following information at the top or on the first page of the document being sent: YYYY-MM-DD_PROJID_doctype_SubjectDetails.xxx

1. Date – YYYY-MM-DD: The date the document was created or formalized for distribution.
3. Type - Document type: such as Letter, Letter of Transmittal, Deliverable, RFI, Submittal, etc.
4. Description - Subject Details: The subject portion of the file name contains any additional, relevant details for the document.
5. File extension - .xxx: The xxx file extension should be the default for the program used to generate the document.

At a minimum, all submittals shall include one hard copy and an electronic copy in PDF format. Hard copies shall be received by DDOT within 24 hours of submitting electronic copies. DDOT reserves the right to request files in other formats at the discretion of DDOT Contract Administrator.

12.2 Performance Requirements

All submittals and Project Documentation for the Project shall be submitted in accordance with Section 28 of these Technical Provisions.

12.3 Design Requirements

12.3.1 Design Documentation Package

All calculations shall be prepared and checked in accordance with the QMP. The calculations shall be available for DDOT review.

The DB Contractor shall conduct all Work necessary to complete the design deviations for the Project per Section 5 of these Technical Provisions.

Prior to the Project Completion Date or termination of the Contract, the DB Contractor shall collect and Technical Provisions

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submit all As-Built Documents prepared in the performance of the Contract. The As-Built Documents shall include, but are not limited to, the following:

1. Design Documentation Package
   a. Design calculations and documentation
   b. Reports and technical memoranda
   c. Deviations
   d. As-Built Plans

2. Updated electronic MicroStation files, including all Released for Construction (RFC) sheets, reference files and base mapping (topography, including survey updates).

The DB Contractor shall ensure that the As-Built Documents reflect the actual condition of the constructed Work to the same degree of detail as the RFC Documents.

The As-Built Documents shall include all changes and corrections to the documents that depict the final completed component, with relevant data shown (including copies of calculations not previously submitted with shop drawings or with the Final Design Submittal).

DDOT will review the submittal and advise the DB Contractor of its acceptance of the As-Built Documents or will provide comments detailing issues to be resolved. The DB Contractor shall address all comments in a manner consistent with the agreed-to comment resolution process and then resubmit the As-Built Documents to DDOT for acceptance.

12.4 Construction Requirements

The DB Contractor shall conduct all Work necessary to provide temporary and permanent final records for the Project in accordance with the DDOT Construction Manual and these Technical Provisions.


Prior to Final Acceptance of the Project, the DB Contractor shall update and re-release all RFC and Design Documents affected by Significant Revision made during construction in accordance with Section 28 of these Technical Provisions. Significant Revisions during construction are modifications to RFC plans requiring typical standard-of-care Engineer-of-Record (EOR) Approval such as engineering calculations, modifications to drawings, or change orders. Minor Changes are elements of the plans, such as dimensional changes to items that do not affect public safety, and in accordance with the Quality Management Plan, do not require review by the Engineer of Record. The DB Contractor shall outline the threshold for these changes in their QMP for review and acceptance by DDOT. The electronic MicroStation and MicroStation data files shall be updated with all Significant Revisions to show the as-constructed conditions, incorporating all revisions made during construction. The DB Contractor shall make all electronic MicroStation and MicroStation data files consistent with the software and drawing conformance requirements of the Technical Provisions and DDOT CAD Standards Manual and shall submit two hard copies of the As-Built Plans and one complete electronic copy of the updated MicroStation and MicroStation data files through e-BUILDER.

All revisions, either Significant Revisions or Minor Changes, to the RFC Documents shall be performed by, or under the direct supervision of, the Engineer of Record for the documents. Each Significant Revision shall contain re-issued sheet of the revised RFC plans, and the cover of each of the re-issued revised RFC Technical Specifications shall include the Professional Engineer’s stamp.

Calculations for design revisions made during construction shall be available for DDOT review and comment Technical Provisions

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prior to implementation of the revisions during construction. Calculations for design revisions made during construction shall be incorporated into the design calculation file when construction is completed in accordance with Section 28 of these Technical Provisions.

As-Built Plans shall reflect the same degree of detail as the RFC Documents. Minor Changes to RFC plans (not requiring EOR reissue of RFC plans or specifications) may be electronically marked with redline in electronic PDF files of the RFC Documents. Underground features including, but not limited to, buried or abandoned structures, shall be documented on the As-Built Plans showing the location and elevation. The DB Contractor shall also provide reproducible originals of the shop drawings for pre-stressed structural elements and all structural steel components.

The DB Contractor shall submit the As-Built Plans as a complete package in sequence. The As-Built Plans shall include the following:

1. Written certification by the EOR and Construction QA Manager that the As-Built Plans follow the processes of the Project Quality Management Plan to reflect all changes and corrections made during construction
2. EOR’s Professional Engineer stamp
3. Accompanying index and instructions
4. Signature blocks on the Title Sheet for signatures by the EOR and the Construction QA Manager. Each sheet of the As-Built Plans shall be stamped or clearly marked “AS-BUILT.”

Maintenance of Traffic (MOT) and Temporary Erosion and Sediment Control (TESC) Plans are exempt from the As-Built requirements.

Final Records

The DB Contractor shall submit the following final records prior to Completion or termination of the Contract. In addition to the formatting specified below the DB Contractor shall submit electronic copies for each item through e-Builder.

1. Final Record Book No. 1
   a. This book of documents shall be bound in a semi-rigid, water-resistant cover and shall include a detailed index. Each page shall be numbered consecutively. The following documents shall be included, and the order in which they are to be arranged is described below. No other material shall be included in this book.
      i. List of Change Orders - Showing the change order numbers, a brief description of each, and the change order cost.
      ii. Record of Construction Materials - Tabulating the source of the construction materials. See Section 25 of these Technical Provisions for additional information.

2. Materials Certification
   a. See Section 25 of these Technical Provisions for additional information on Materials Certification.

3. As-Built Plans
   a. As-Built Plans, 11 inch by 17 inch, red line prints. Each plan sheet shall have lettering or a stamp identifying it as As-Built Plans.
   b. Prints of Approved shop drawings

4. Structures (if applicable)
5. **DB Contractor Construction Survey**
   a. Copies of all survey calculations and survey notes including grade books and cross-section notes shall be kept and turned over to DDOT with the final records.

6. **Temporary Final Records**
   a. Temporary final records are comprised of all relevant records not included in the final records. The DB Contractor shall submit these to the DDOT COR with the final records. Refer to the DDOT Construction Manual for requirements.

### 12.5 Submittals

In addition to the requirements stated here-in, all submittals shall meet the requirements Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

#### 12.5.1 Summary of Submittals

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<th>DDOT Review Type</th>
<th>Schedule</th>
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<tbody>
<tr>
<td>1</td>
<td>12.1.3.3</td>
<td>Document Control Work Plan</td>
<td>Submit</td>
<td>Within 30 Calendar Days of issuance of NTP or prior to the first design submittal</td>
</tr>
<tr>
<td>2</td>
<td>12.3</td>
<td>Design Documentation Package</td>
<td>Submit</td>
<td>With each design package submission and prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>3</td>
<td>12.3</td>
<td>Updated Electronic MicroStation and Inroads files, including all RFC sheets, reference files, and base mapping</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
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<tr>
<td>4</td>
<td>12.4</td>
<td>Calculations for design revisions made during construction</td>
<td>Review and Comment</td>
<td>Prior to implementation of the revisions during construction</td>
</tr>
<tr>
<td>5</td>
<td>12.4</td>
<td>As-Built Plans and specifications/special provisions</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>6</td>
<td>12.4</td>
<td>Final Record Book No. 1</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>7</td>
<td>12.4</td>
<td>Project Diaries, Daily Reports, and the DB Contractor’s Daily Reports of Traffic Control</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>8</td>
<td>12.4</td>
<td>Materials Certification</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>9</td>
<td>12.4</td>
<td>Structures Records</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>10</td>
<td>12.4</td>
<td>Test Reports for Storm Sewers, Sanitary Sewers, and Water Mains</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>11</td>
<td>12.4</td>
<td>DB Contractor Construction Survey</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
</tr>
<tr>
<td>12</td>
<td>12.4</td>
<td>Temporary Final Records</td>
<td>Submit</td>
<td>Prior to completion or termination of the Contract</td>
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</table>
13 Structures

13.1 General
The DB Contractor shall be responsible for all Elements of Work necessary for the design and construction of permanent and temporary structures, including modifications to existing structures, in accordance with the Contract Documents.

Elements of Work may include, but are not necessarily limited to, bridges, retaining walls, sign structures, lighting structures, barriers and other structures as described in these Technical Provisions.

Use the corresponding section of the AASHTO LRFD Bridge Design Specification where the AASHTO Standard Specification is referenced in the DDOT Design and Engineering Manual.

Coordination with WMATA and/or CSXT may be required for the construction of both permanent and temporary structures. All requirements of the WMATA Adjacent Construction Project Manual and the CSXT Public Project Information manual shall be met, as applicable. Formal Approval from CSXT and/or WMATA has not been obtained. The DB Contractor is responsible for all coordination and Approvals. Soil nail walls are not permitted on this project per WMATA request.

All portions of all permanent structures shall be entirely on DDOT right of way, National Park Service property, or permanent easements from WMATA and Aggregate Industries.

13.1.1 Retaining Wall Structures
The following is a list of potential retaining walls within the limits of the project as identified within the reference documents. The DB Contractor is responsible for identifying and designing all retaining walls for this Project including the retaining walls identified below.
- Approximately Sta. 112 + 50 to Sta. 115 + 00
- Approximately Sta. 116+10 to Sta. 117+20 and Sta. 123 + 25 to Sta. 127 + 40 – See also Section 15 of these Technical Provisions for specific visual quality requirements for these walls and any other walls proposed on National Park Service property.

13.2 Performance Requirements

13.2.1 Personnel Requirements
These requirements are in addition to the requirements listed in the Project’s RFQ.

The Lead Structure Engineer shall be a Professional Engineer licensed in the District of Columbia and shall have experience with projects similar in scope, nature, and complexity.

Responsibilities Include:
- Sign and seal Design Plans and As-Built Plans.
- Review and respond to RFI’s.
- Review Shop Drawings.

13.2.2 Corrosion Protection
The DB Contractor shall design and construct the permanent walls to achieve a required life of 75 years.

The DB Contractor shall assess corrosive conditions that may occur due to stray direct current (DC) from WMATA infrastructure adjacent to the Project. The DB Contractor shall establish corrosion control...
measures, if needed, to include stray current mitigation, protective coating, and cathodic protection. Grounding and bonding as deemed necessary by the stray current assessment and as required by the WMATA Adjacent Construction Project Manual shall be provided.

13.3 Design Requirements

13.3.1 General
The DB Contractor shall meet the landscape and visual quality requirements described in Section 15 of these Technical Provisions.

Ductility and Redundancy Factors shall be as per AASHTO LRFD Bridge Design Specifications Clauses 1.3.3 and 1.3.4 respectively. All retaining walls shall be classified as Typical. Operational Importance Factors, \( \eta \), shall be 1.00.

13.3.2 Geometry
Note used.

13.3.3 Materials
All material shall be new and acquired for this specific Project unless otherwise stated. The DB Contractor shall utilize methods to minimize graffiti or provide a coating system to deter graffiti on all surfaces accessible by pedestrians, except sidewalk surfaces.

13.3.3.1 Concrete
The use of lightweight concrete is not permitted unless stated otherwise herein or Approved by DDOT.

13.3.3.2 Reinforcement
Reinforcing Steel shall be corrosion protected in the following locations:
1. Barriers and medians
2. Moment slabs

13.3.3.3 Structural Steel
Structural steel shall meet the requirements of ASTM A709. Stainless steel shall meet the requirements of ASTM A240 Type 316 or 316L or ASTM A276 Type 316 or 316L. Bare weathering steel is not permitted. All high strength bolts shall conform to ASTM A325.

13.3.3.4 Stone Veneer
Nominal stone thickness shall be 4 in to 6 in. All other requirements shall be in accordance with Section 708 of the DDOT Standard Specifications for Highways and Structures.

13.3.4 Loads and Forces
All loads shall be in accordance with AASHTO LRFD Bridge Design Specifications unless specified herein.

13.3.5 Inspection, Maintenance and Access
Not used.

13.3.6 Retaining Walls
The DB Contractor shall design and construct the Project in a manner which ensures that allowable settlement has occurred prior to the placement of final lift paving and the achievement of Substantial Completion.

Tolerable vertical and lateral deformation criteria for retaining walls shall be developed based on the function and type of wall, anticipated service life, and consequences of unacceptable movements (i.e., both
structural and aesthetic). The followings are required tolerable long-term movements of walls:

1. Maximum tolerable lateral movement of secant pile walls, tie-back walls, and other rigid and semi-rigid walls under service load is 1 inch.

2. Maximum tolerable lateral movement of flexible retaining wall, including cantilever wall without tiebacks or deep foundation, under service load is 1 percent of exposed wall height but not to exceed 3 inches.

3. Maximum tolerable vertical movement of rigid or semi-rigid wall is 1 inch.

For MSE walls, the total settlement criteria in AASHTO LRFD 11.10.4.1 shall be followed. Geosynthetic material shall not be used as reinforcement of a permanent MSE wall. MSE wall shall be designed for 75-year design life. MSE wall backfill materials within reinforced zone shall be free drainage coarse aggregates unless lightweight foamed concrete fill (LFCF) is used. Filter fabric shall seal the MSE wall panel joints to prevent loss of backfill. Where LFCF is used, drainage measures with minimum 6-inch perforated pipe connected to a drainage facility/manhole shall be used to avoid groundwater accumulation behind LFCF.

For MSE wall under pavement, an impervious membrane shall be placed below the pavement and just above the first row of reinforcement to intercept any flows containing deicing chemicals. The membrane shall be sloped to drain away from facing to an intercepting longitudinal drain outletting beyond the reinforced zone to a drainage facility.

MSE Walls shall not be placed within the 100-year flood zone.

Soldier pile and lagging walls shall receive a concrete coping and a cast-in-place concrete facing.

Stone facing shall be installed only after the wall settlement is substantially completed and stabilized and the retaining settlement and horizontal deflection is less than 1 inch or manufacturer/vendor recommended allowable limit, whichever is smaller. A Geotechnical Instrumentation Plan shall be developed in accordance with Section 6 of these Technical Provisions and implemented to verify the substantial completion of settlement and movement of the walls. DB Contractor shall establish lower deflection limits if required to ensure the long-term performance of any wall with stone facing.

Granular permeable backfill and 6-inch, perforated longitudinal drainage pipe in accordance with DDOT Standard Drawing No. 602.01 shall be used to facilitate drainage behind cast-in-place walls.

If any existing walls are to remain in place, its structural and material integrity and stability under new loading condition shall meet current design standards and design life specified in this document.

13.3.7 Street Lighting

Street lighting shall be in accordance with the requirements of Section 16 of these Technical Provisions.

13.3.8 Retaining Wall Barriers and Railings

Pre-cast concrete barriers shall not be used for permanent applications.

Permanent traffic barriers and railing systems shall meet the requirements established in the National Cooperative Highway Research Project (NCHRP) Report 350 if tested prior to the adoption of the AASHTO Manual for Assessing Safety Hardware (MASH). Permanent traffic barriers and railing systems manufactured after the adoption of MASH shall meet the requirements of MASH. Fencing, railing, barriers and parapets shall meet the aesthetic requirements of Section 15 of these Technical Provisions. Traffic barriers and railings shall be the height and FHWA minimum-impact test level as shown in Table 13-6 herein.

The DB Contractor shall modify the railing plans shown in the Standard Plans, as necessary, to meet the
Visual Quality Requirements in Section 15 of these Technical Provisions. Concrete barrier type shall be consistent throughout the project. Visual quality requirements described in Section 15 of these Technical Provisions shall not adversely affect the strength and safety requirements of the barriers.

Pedestrian Loading for barriers shall be in accordance with AASHTO LRFD Bridge Design Specifications.

The need for and type of barriers and railings on retaining walls shall generally be determined by the DB Contractor based on AASHTO criteria and sound engineering judgement, subject to review and Approval by DDOT. For the potential retaining wall located from approximately Sta. 112+50 to Sta. 115+00, a TL-2 combination vehicular and pedestrian railing is required.

13.3.9 Overhead Lighting Structures

The DB Contractor shall design retaining walls and foundations to account for the placement of any overhead lighting supports on or behind the retaining walls.

Foundations shall not be located in a drainage ditch.

Refer to Sections 16 of these Technical Provisions for additional requirements.

13.3.10 Temporary Structures

13.3.10.1 Temporary Bridges

A temporary bridge is any bridge or portion of a bridge that will not remain upon completion of the Contract and will be in service less than 5 years.

All temporary bridges shall be designed for live load deflection less than L/800 as defined by AASHTO.

The DB Contractor shall overlay precast deck panels or precast deck bulb-tee girders with a minimum hot mix asphalt (HMA) wearing course of 2 inches in thickness or provide a minimum 1.5-inch concrete overlay. The minimum cross-slope of the wearing course shall be 0.01 feet per foot.

The DB Contractor shall be responsible for the maintenance of all temporary bridges.

The demolition of temporary structures shall comply with Section 3 of these Technical Provisions. The site condition shall be in a condition as good as or better than prior to installation of temporary structure.

13.3.10.2 Temporary Retaining Walls

A temporary retaining wall is any wall or portion of wall that will not remain upon completion of the Contract.

Structural components of temporary retaining walls may be reused as part of permanent retaining wall systems, provided all of the structural support elements and materials of the temporary retaining walls meet the requirements for permanent walls and are designed for all loads in the permanent condition. The DB Contractor shall not use timber piles as foundations for temporary retaining walls. The DB Contractor shall be responsible for maintenance of temporary wall structures.

Temporary retaining walls may be abandoned and left in place by the DB Contractor, if Approved by DDOT, on the condition that the temporary walls are no longer required for ground support or permanent retaining walls are constructed to replace them. Temporary retaining walls shall be removed in accordance with Section 3 of these Technical Provisions. Temporary retaining walls constructed of treated timber shall be removed entirely.

13.3.10.3 Submittals

Design of temporary structures shall be prepared under the direct supervisions of and the plans signed by a Registered Professional Engineer in the District of Columbia.
13.4 Construction Requirements
Cranes, drill rigs, and other construction equipment exceeding the legal load shall not be operated on structures without DDOT’s written Approval.

The DB Contractor shall follow the steps for demolition of existing structures as outline in Section 3 of these Technical Provisions.

Temporary bracing shall be provided as needed during construction in accordance with the AASHTO Guide Specifications for Bridge Temporary Works and the AASHTO Construction Handbook for Bridge Temporary Works.

13.5 Submittals
In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

13.5.1 Design Submittals
All plans, calculations, working drawings, reports and load ratings shall list the DDOT Project Number and DDOT Structure Number.

13.5.1.1 Plans
The DB Contractor shall submit Preliminary, Final and Released for Construction Documents on DDOT standard sheets for the bridges, including temporary bridges; retaining walls, including temporary retaining walls; sign structures; lighting structures; and other minor structures. Plans shall be signed and sealed by a Professional Engineer licensed in the District of Columbia and Approved by DDOT prior to fabrication or construction.

13.5.1.2 Calculations
The DB Contractor shall provide complete sets of calculations to support all structural designs described herein. Complete sets of calculations shall be included with each design review submittal (including temporary structures, falsework, and other temporary works).

All final design calculations shall include the stamp of a Professional Engineer licensed in the District of Columbia. The sets of calculations shall include the following:
1. Index Sheets – These shall include numbered calculation sheets and an index by subject with the corresponding sheet numbers. The name of the Project, structure number, designer/checker initials, date (month, day, and year), and supervisor’s initials shall be listed.
2. Design Calculations – These shall include design criteria; loadings; structural analysis; moment, shear and axial load envelopes; and pertinent computer input and output data (reduced to an 8.5-inch by 11-inch sheet size).

13.5.2 Summary of Submittals

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14 Hydrology and Hydraulics

14.1 General

The Design-Build Contractor (DB Contractor) shall provide and/or perform all investigations, evaluations, analysis, coordination, documentation, and design required to meet all Hydrologic and Hydraulic, Drainage, Stormwater Management, Erosion and Sedimentation Control, Stormwater Pollution Prevention, and Municipal Separate Storm Sewer System (MS-4) permitting requirements.

The DB Contractor shall conduct all drainage Work necessary to design, document, and construct the trail storm sewer system, culverts, underdrains, trailside ditches, stormwater management facilities, and erosion and sediment control measures for the Project. The DB Contractor shall demonstrate that there will be no potential flooding damage to all adjacent property, including the CSXT and WMATA property, as a result of the Metropolitan Branch Trail Project. The DB Contractor’s approach to drainage design and construction should demonstrate that the DB Contractor will make sound engineering efforts to avoid risks and minimize future maintenance requirements for all drainage-related items. The DB Contractor’s Stormwater Management Plan (SWMP) and Erosion and Sediment Control Plan shall describe how the DB Contractor will prevent or minimize potential environmental impacts.

Elements of the hydrologic, hydraulic, and drainage Work shall include, but are not limited to, the design and construction of the following:

- Hydrologic and hydraulic analysis for the design of storm sewer and stormwater management systems;
- Catch basin spacing and storm sewer system design for both permanent facilities and temporary construction conditions;
- Trailside ditch design;
- Erosion and sediment control measures;
- Stormwater management as required to meet the mandatory federal and District Standards and permitting requirements;
- Best Management Practices, including green infrastructure low impact development, bioretention, permeable pavement, and other practices to retain and improve the quality of stormwater;
- Maintenance of existing offsite flows that pass through the Project area;
- Subsurface drainage systems including maintaining existing DC Water storm sewer systems and/or improve, if necessary;
- Design of underdrain systems that include adequate storm sewer connections and/or outfalls for future maintenance access;
• Design documentation;
• Protection of existing collection, conveyance, detention, runoff treatment, and other existing facilities; and
• Cleaning of the existing culvert and storm sewer systems, refer also to Section 29 of these Technical Provisions.

Catch basin spacing, storm sewer pipe systems, culverts, and trailside ditches shall be designed per District Department of Transportation (DDOT) and DC Water (previously known as District of Columbia Water and Sewer Authority [WASA]) design criteria and specifications. Additionally, all pipes, ditches, and other structures carrying surface drainage on CSXT property and/or adjacent to CSXT tracks shall be designed in accordance with CSXT drainage requirements. The design plans for the storm sewer systems shall be submitted to DDOT, DC Water and CSXT for review, permitting, and/or Approval as appropriate, for each agency, prior to construction.

The Project stormwater management facilities and erosion and sediment control measures shall be designed in accordance with the District Department of the Environment’s (DOEE’s) design guidebook. Efficient performance of the drainage system utilizing best management practices (BMPs) and environmentally sustainable solutions is an integral part of the operation of the Project. The DB Contractor shall account for all sources of runoff that may reach the Project, whether originating within or outside the Project right-of-way (ROW), in the design of the drainage facilities.

All BMP design shall comply with the DOEE Stormwater Management Guidebook (SWMG). The BMP design shall be submitted to DDOT and DOEE for review, permitting, and/or Approval as appropriate prior to construction.

DB Contractor shall be responsible for all permits, approvals and any fees associated with receiving the necessary approvals to perform the Work.

14.1.1 Methodology and Computer Software

The following list of primary methodologies and computer software are accepted by DDOT for use on the Project. Use of other methodologies and/or computer software by the DB Contractor may require submittal of additional details about the methodologies and/or computer software and coordination/acceptance from DDOT that the programs conform to existing programs.

Approved methodologies and software include:
1. DOEE Calculator-General Retention Compliance spreadsheet
2. DOEE Maximum Extent Practicable (MEP) Worksheet
3. Federal Highway Administration (FHWA) HY-8, Culvert Hydraulic Analysis Program
4. GEOPAK Drainage, Bentley
5. FlowMaster, Bentley
6. Hydro-CAD Stormwater Modeling
7. CulvertMaster, Bentley
8. PondPack, Bentley
9. Win TR-20, Natural Resources Conservation Service (NRCS)
10. Win TR-55, NRCS
11. Rational Method/Modified Rational Method
12. Stormwater Management Modeling (SWMM) Computer Model, United States Environmental Protection Agency (EPA)

14.2 Performance Requirements
The storm sewer system consists of runoff collection systems, conveyance systems, flow control facilities, stormwater retention volume facilities, and outfalls for the Project’s new impervious and pollution-generating surface areas and shall meet the requirements of this Section, the Mandatory Standards, and the Project permits. The DB Contractor shall maintain and provide facilities for handling other runoff from non-pollution-generating surfaces; flows originating from offsite; and cross-drainage, as required, in the Mandatory Standards and the Project permits. These storm sewer, quantity control, stormwater retention volume, and cross-drain facilities shall be sized using the methods described in the Mandatory Standards.

14.3 Design Requirements
14.3.1 Hydrologic and Hydraulic Analysis
The DB Contractor shall comply with DCMR, DDOT Design Manual, FHWA Compliance, and AASHTO Guidelines in performing hydrologic and hydraulic analyses. Many hydrologic and hydraulic methods are available. The selected method should be calibrated to local conditions and verified for accuracy and reliability. It is the DB Contractor’s responsibility to examine all applicable methods and obtain DDOT’s concurrence as to which is the most appropriate one to use. The DB Contractor shall develop a Hydrologic and Hydraulic (H&HA) section in all appropriate storm sewer and stormwater management reports detailing analysis methodology, input parameters and conclusions.

14.3.2 Storm Sewer System
The DB Contractor shall design all elements of the drainage facilities in accordance with applicable design criteria and Good Industry Practice. The design of new and reconfigured storm sewer systems shall meet DDOT and DC Water Standards and performance requirements. All pipes, ditches, and other structures carrying surface drainage on CSXT property and/or adjacent to CSXT tracks shall meet CXT performance requirements.

The DB Contractor shall provide storm sewer systems compatible with existing DC Water storm sewer systems and all applicable drainage plans or Approved systems.

The DB Contractor shall base its final design on design computations and risk assessments for all aspects of Project drainage and is encouraged to seek cost-effective solutions that provide equal or greater environmental benefits and reduced long-term maintenance, with respect to the solutions shown in the Conceptual Design Plans. Cost-effective solutions may include the innovative use of stormwater retention volumes and quantity control techniques, BMPs, reduction or conversion of existing impervious surfaces, and design features that lead to the increased infiltration of stormwater runoff where practical and feasible.

14.3.2.1 Data Collection and Conveyance Structures
To establish a drainage system that complies with the requirements and accommodates the historical hydrologic flows in the Project Limits, the DB Contractor is responsible for collecting all necessary data and performing all hydrologic and hydraulic investigations for the design and construction of the drainage system.

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The DB Contractor shall collect available data identifying all water resource issues, including stormwater retention volume requirements as imposed by DOEE and federal government regulations; National Wetland Inventory and other wetland protected waters inventories; FEMA-mapped floodplains; and official documents concerning the Project, or other drainage studies. Water resource issues include areas with historically inadequate drainage (flooding or citizen complaints), environmentally sensitive areas, localized flooding, maintenance problems associated with drainage, and areas known to contain Hazardous Materials. The DB Contractor shall also identify protected waters, ditches, and areas classified as wetlands or floodplains.

The DB Contractor shall acquire all pertinent existing storm sewer plans and/or survey data, including data for all culverts, drainage systems, and storm sewer systems within the Project Limits. The DB Contractor shall also identify existing drainage areas that contribute to the Project drainage system and the estimated runoff used for the design of the existing system.
The elements of the existing drainage system (i.e., the DC Water storm sewer trunk lines) within the Project Limits scheduled to remain-in-place must meet hydraulic capacity requirements per design information obtained from DC Water.

All proposed drainage structures within the Project Limits shall be sized and/or checked for capacity and included in the DB Contractor’s SWMP. Where proposed DC Water trunk lines connect to existing DC Water trunk lines, proposed discharge rates will be submitted to DC Water for existing capacity verification.

The DB Contractor shall investigate and perform a TV inspection of the existing drainage system within the Project Limits as part of the Existing Conditions Drainage Survey before and after construction to identify any damage caused by the construction and as described in Section 5 of these Technical Provisions. Additionally, this TV inspection can be used to determine the condition, size, material, location, and other pertinent information of the existing drainage system. The collected data shall be incorporated into the Final Design of the drainage facilties.

The DB Contractor shall design all drainage facilities to accommodate probable future land use in accordance with current development plan policy. The DB Contractor shall incorporate anticipated changes in the land use and characteristics to the hydrologic parameters. This may affect the magnitude of runoff and the design capacity of drainage structures.

14.3.2.2 Storm Sewer Systems
The proposed capacity of the DC Water storm sewer pipes is designed using the discharge rate and slope of each reach. These computations start at the upstream reach then proceed downstream reach by reach to the point where the proposed DC Water storm sewer connects to the existing DC Water storm sewer trunk line or the outfall. The DB Contractor shall design closed systems to convey runoff per DDOT and DC Water standards and criteria.

All pipes, ditches, and other structures carrying surface drainage on CSXT property and/or adjacent to CSXT tracks shall be designed with, but not limited to, the following drainage requirements:

1. Shall be designed to carry the run-off from a one hundred (100) year, 24-hour design storm without ponding of water against the roadbed.

2. Pipes and culverts within the live load influence zone shall conform to current AREMA recommendations and ASTM specifications. All such structures shall be designed to carry Cooper’s E-80 loading with diesel impact.

The DB Contractor shall prepare storm sewer plan sheets to be included in the SWMP that contain, at a minimum, the following items:

1. Drainage area maps for each storm sewer catch basin with pertinent data, such as boundaries of the drainage area, topographic contours, runoff coefficients, time of concentration flow paths, land use with design curve number and/or design runoff coefficients, discharges, velocities, ponding, and hydraulic grade line data.

2. Location and tabulation of all existing and proposed pipe and drainage structures. These include size, class or gauge, catch basin spacing, detailed structure designs, and any special designs.

3. Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and alternative pipes.

4. Complete pipe profiles, including pipe size, type, and gradient; station offsets from the centerline of the roadway; length of pipe; class/gauge of pipe; and numbered drainage structures with coordinate location and elevations.
The DB Contractor shall design all storm sewer systems such that the hydraulic grade line for the design frequency event does not exceed any critical elevation that will cause unacceptable inundation of the trail or adjoining property. This requirement includes the top elevations of drainage structures (manholes, junction boxes, and catch basins) along with the throat length of catch basins.

**14.3.3 Best Management Practices**

The stormwater management regulations issued by DOEE (DCMR, Title 21, Chapter 5) and the DOEE SWMG, shall be used by the DB Contractor to comply with the District’s MS4 Permit issued by EPA. The DB Contractor shall complete the design of the BMPs to meet requirements for the stormwater retention volume, quantity control requirements (Qp2 and Qp15), and the extreme flood requirements (Qd) as determined by the current DOEE Stormwater Management and Soil Erosion and Sediment Control regulations.

The DB Contractor shall consider applying green infrastructure and Low Impact Development (LID) in the Project in order to meet the regulatory requirements for the stormwater retention volume. Any proprietary stormwater treatment products proposed by the DB Contractor shall be specifically submitted for review and Approval to DDOT and to FHWA for a public interest finding prior to being incorporated into the Project.

The Preliminary SWMP included with the RFP package is considered to be conceptual and intended for initial informational purposes only, providing the DB Contractor with a concept which may contain numerous general depictions of existing and/or anticipated conditions. The DB Contractor shall be responsible for ensuring that all design standards are incorporated properly into the final drainage design.

The DB Contractor shall review the BMP selection process in the DOEE SWMG and document the procedures and final selections. The use of enclosed vaults, tanks, or galleries for runoff quantity control or stormwater retention volume shall be minimized. Where vaults, tanks, or galleries are required, the DB Contractor shall minimize the sizes by incorporating other BMPs, wherever practicable. The DB Contractor shall design vaults and BMP facilities in such a manner that they can be expanded or accommodate adjacent additional vaults/BMPs for runoff quantity control requirements for forward compatibility. Information on any future improvement designs is available from DDOT.

**14.3.4 Erosion and Sediment Control for Design**

The DB Contractor shall develop an Erosion and Sediment Control (ESC) plan in compliance with DCMR, DOEE’s Soil Erosion and Sediment Control Handbook and Rulemaking on Stormwater Management and Soil Erosion and Sediment Control. The DB Contractor shall comply with the DOEE Approved ESC Standards and Specifications.

The DB Contractor shall submit an ESC plan for DOEE’s review and Approval as a requirement to the construction permit issued by DCRA. ESC measures shall be installed in accordance with applicable standards and specifications on the Project Site undergoing clearing and grading. The DB Contractor shall exercise temporary and permanent measures throughout the Project term to control erosion and prevent or minimize siltation of rivers and streams.

Erosion prevention methods shall be used to protect railroad ditches and other drainage facilities during construction on and adjacent to CSXT property. Permanent erosion and sediment pollution control facilities on CSXT property shall be designed for the 100-year storm.

**14.3.5 Coordination**

Prior to proceeding with the Drainage Design, the DB Contractor shall meet with the DDOT Stormwater Team.

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The purpose of this meeting is to provide information to the DB Contractor to better coordinate the Preliminary and Final Drainage Design efforts. This meeting is mandatory and will occur within 30 Calendar Days following Notice to Proceed (NTP) and prior to any submittals containing drainage components.

The DB Contractor shall coordinate all storm sewer systems, floodplain, stormwater management, and other water resource-related issues with affected interests and regulatory agencies. The DB Contractor shall document the resolutions of these issues.

The DB Contractor shall coordinate with and involve the Utility owners, as the need occurs, and keep them informed on the status of the Project’s development. This coordination will minimize damage and interruptions to the Utilities and will help eliminate conflicts and coordination problems with the DB Contractor’s operations.

- The DB Contractor shall coordinate and conduct a preliminary review meeting with all affected Utilities to assess and explain the impact of the Project.
- The DB Contractor shall provide all Utilities with roadway design plans as soon as the plans have reached a level of completeness adequate to allow them to fully understand the Project’s impacts.

The DB Contractor shall provide temporary drainage systems to the greatest extent practicable for the safety and convenience of the general public and residents and the protection of people and property during construction.

14.3.6 Drainage and SWM Submittals

14.3.6.1 Storm Drain Design Plans
The DB Contractor shall prepare Utility/drainage construction plan sheets in accordance with the Standard Specifications and Section 2 of the DDEM.

In addition to the items listed in the DDEM, all sensitive areas (including wetlands, streams, riparian zones, and their buffer boundaries), stream and wetland ordinary high water elevation contours shall be shown on the grading and Utility/drainage plan sheets. The grading plans shall also show placement locations and type requirements for the high-visibility sensitive area protective fencing.

The DB Contractor shall be required to provide a staging schematic to CSXT to demonstrate continuity of flow between the existing concrete drainage channel and the proposed pipe along the trail centerline during all stages of construction.

The DB Contractor shall be required to submit storm drain plans to DC Water for review and Approval.

14.3.6.2 Stormwater Management Plan
A SWMP shall be prepared by, or under the direct supervision of, the Lead Stormwater Engineer. The SWMP shall be in accordance with the DDEM and the DOEE SWMG.

The DB Contractor shall submit a Draft SWMP to support DDOT’s review of the drainage design drawings. The Draft SWMP shall show the DB Contractor’s overall Project stormwater retention volumes, quantity control requirements (Qp2 and Qp15), extreme flood requirements (Qf), and the storm sewer concept for the Project. In particular, the report shall include the overall basin and drainage area layouts; locations of cross-drains and outfalls; floodplain impact analysis; basic hydrology and hydraulic calculations; downstream analysis; major conveyance system layout; and concepts to be used at specific locations for the stormwater retention volume and flow control of the Project runoff.

The DB Contractor shall update the SWMP to reflect changes in the original design during construction. All Technical Provisions
drawing submittals for changes made during construction shall include a supplemental hydraulic design attachment to support DDOT design review. The supplements shall reference the SWMP and be specific as to the changes; be easily readable as stand-alone documents; show why the revision was made and how it affected the design; and include the revised drawings and exhibits, supporting calculations, and revised summaries and tables. The combined SWMP and supplemental updates shall reflect the design and As-Built condition of the drainage system at the end of construction.

The DB Contractor shall assemble the Final SWMP and all Supplemental SWMPs into a single document, in accordance with Chapter 5 of the DOEE SWMG. The Final SWMP shall incorporate the final As-Built documentation in accordance with Chapter 5, including the updated report text, records of decision, associated design criteria, drainage maps, Utility/drainage plans and profiles, stream restoration plans, calculations, and profiles. The Final SWMP is subject to review and comment.

14.3.6.3 Design Calculations/Reports

The DB Contractor is responsible for completing all calculations necessary for the design of the Project. The DB Contractor shall prepare calculations in accordance with the DDEM and the DOEE SWMG to support the design shown on the Utility/drainage plans and profiles.

The calculations shall include a narrative that describes the approach taken and the order of the calculations, including sections on the methodologies used (appropriateness and accuracy requirements), design decisions made, and resultant summaries. The calculations shall include copies of the input and output printouts from the supporting computer programs, spreadsheets, hand calculations, exhibits, and sketches. The calculations shall also include, but are not limited to, the following items:

1. Index Sheets – The DB Contractor shall number all calculation sheets and prepare an index by subject with the corresponding sheet numbers. The DB Contractor shall list the name and number of the Project, designer/checker initials, date (month, day, and year), and supervisor’s initials.

2. Design Calculations – These calculations shall include design criteria, hydrology and hydraulic calculations, and pertinent computer input and output data (reduced to 8.5-inch by 11-inch sheet size). The calculations shall include a narrative of the approach taken and final conclusions and summaries of the calculation results in both narrative and table format. The calculations shall be in logical order, technically clear, and cross-referenced to correspond directly with drainage structure and basin numbering on the Utility/drainage plans, maps, and exhibits for ease of reference.

3. Special Design Features – The DB Contractor shall include a brief narrative of major design decisions or revisions and the reasons for them.

4. Design decision summaries.


6. Drainage maps showing the hydrologic features, drainage basins, sub-basins, existing and final conveyance and cross-drain structures, flow direction arrows, numbering system, and any other features necessary to support and clarify the design calculations. The drainage maps shall also show all geotechnical and environmental sensitive areas, streams and wetlands with buffer boundaries, riparian zones, and the ordinary high water, sanitary drain fields, and major Utilities that will affect the drainage design. The drainage design drawings and maps shall be on 11-inch by 17-inch bond paper.

7. Documentation justifying use of vaults and detention tanks in place of enhanced bioretention BMPs.

8. Other exhibits to provide details necessary to clarify and support the calculations.
14.4 Construction Requirements
The DB Contractor shall design the drainage to accommodate construction staging. The design shall include temporary erosion control ponds and other BMPs needed to satisfy DOEE and other regulatory requirements. All fees related to required permits, reviews or other processes shall be the responsibility of the DB Contractor. The drainage notes in the plans shall include a description of the drainage design for each stage of construction.

14.4.1 Construction and Mitigation Permits
The DB Contractor shall be responsible for all drainage-related mitigation.

14.4.2 Erosion and Sediment Control for Construction
The DB Contractor shall develop a Stormwater Pollution Prevention Plan (SWPPP) including, but not limited to, an Erosion and Sediment Control (ESC) Plan and narrative which meets the requirements of the National Pollution Discharge Elimination System Permit. Additionally, a Post Construction Storm Water Management Plan shall be prepared and implemented by the DB Contractor which meets District and Federal requirements for the Project site.

The Project shall adopt ESC practices when planning to clear, grade, or otherwise disturb the existing land surface. An ESC Plan must be developed and Approved by DOEE before grading permits can be issued.

ESC 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 Project construction to ensure effective and continuous erosion and siltation control. Permanent erosion control measures and drainage facilities shall be installed and operational as the Project construction progresses before temporary measures are removed.

Erosion and siltation control devices and measures shall be maintained in a functional condition at all times to meet the appropriate requirements of the District of Columbia Standards and Specifications for Soil Erosion and Sediment Control. The DB Contractor shall have, within the limits of the Project during all land disturbing activities, an employee certified in ESC through a DOEE-Approved training program. This employee shall inspect erosion and siltation control devices and measures for proper installation and maintenance, and shall inspect for, and evaluate any deficiencies immediately after each rainfall.

14.4.3 Protection and Restoration of Sensitive Resource Areas
All DB Contractor staff shall have environmental training and be aware that no access or impacts are permitted beyond the high-visibility construction fencing. All sensitive areas (including wetlands, streams, riparian zones, and their buffer boundaries) shall be protected. Where possible, pipe outfalls to natural waterways shall be constructed using infiltration trenches with overtopping level spreader designs for a more natural dispersion type discharge. Direct pipe discharge shall be armored against erosion using bioengineering techniques, to the greatest extent possible. All temporary Work areas for pipe or ditch Work shall be graded, and vegetation restored to existing conditions. Refer to Section 8 of these Technical Provisions.

14.4.4 Abandonment and Removal of Existing Drainage Structures
Abandonment and/or removal of existing drainage structures and pipes when authorized shall meet the applicable requirements of the District of Columbia Standards and Specifications. Any existing storm sewer pipe or drainage structure that is planned to be abandoned and remains under any traffic pavement shall be filled using methods and materials that ensure the pipe or structure is completely filled in a supported, non-void condition. The DB Contractor plans shall include the abandonment details, including any abandon-
in-place filling methods and materials, with the drainage structure and pipe shop drawings.

14.4.5 Other Drainage Requirements
The DB Contractor shall provide temporary drainage systems to the greatest extent practicable for the safety and convenience of the general public and residents along the roadway and the protection of persons and property during construction. The DB Contractor shall clean all drainage facilities and remove debris and sediment to ensure proper operation at all times during construction. The DB Contractor shall maintain existing drainage patterns at all times during construction. The minimum design storm for temporary drainage design shall be the 10-year storm event.

All drainage facilities (new and existing) within the Project area shall be cleaned out by the DB Contractor prior to Final Acceptance.

The existing CSXT drainage ditches, facilities and patterns shall be maintained during construction and in the final condition. No additional drainage shall be directed toward CSXT track as a result of the subject project work. Nor shall existing patterns draining CSXT’s track area be impeded, causing ponding. If, in the course of construction, it is necessary to block a ditch, pipe, or other drainage facility on CSXT property and/or adjacent to CSXT tracks, then temporary pipes, ditches, or other proposed drainage facilities shall be installed to maintain adequate drainage, as Approved by CSXT. Upon completion of the project, the temporary facilities shall be removed and the permanent facilities restored.

14.4.6 Existing Conditions Drainage Survey
The DB Contractor shall provide the type, size, location, and video surveys of all existing DC Water storm sewer systems that will remain in place after completion of the Project within the existing ROW.

As part of the Preliminary Design Submittal, the DB Contractor shall complete the existing condition inventory, survey, and TV inspection, as required, to include all existing DC Water storm sewer systems and associated structures that are to remain in place within the Project Limits. This Work shall include storm sewers and cross-drains. The survey shall identify each system by Project stationing, and show the pipe end and structure coordinates, sizes, and types; invert elevations at pipe ends and top of structures; skews; the general condition of the structure; the upstream and downstream channel profile; and cross sections within the construction limits.

The inspections shall be done using video sewer inspection techniques. If additional storm sewer systems are identified, the DB Contractor shall prepare a supplement to the Existing Conditions Drainage Survey describing the condition of the pipe systems to remain in place, including summaries of the inventory survey, pipe types, general condition of the pipe, and structures for each system, along with photo and plan exhibits that illustrate the general condition and specific problems of each pipe run. The report shall identify specific failures and blockages.

Before and after construction, all existing pipes to remain in place within the Project Limits will be cleaned and TV inspected.

The DB Contractor shall submit the draft Existing Conditions Drainage Survey for DDOT review along with or prior to submittal of the Draft SWMP. The final Existing Conditions Drainage Survey shall include all supplemental survey and revisions incorporating DDOT review comments, the before and after construction inspection videos, and electronic format survey data.

14.4.7 Shop Drawings
The DB Contractor shall submit shop drawings for all drainage structures and pipe elements.

Prior to the manufacture of non-standard items, the DB Contractor shall furnish DDOT a certification of the acceptability of the design of such non-standard items, as determined from a review, which shall be made by Technical Provisions.
the lead stormwater engineer and shall cover all design data, supporting calculations, and materials.

14.4.8 Design Revisions During Construction
Calculations for revisions made during construction shall be incorporated into the Final SWMP and submitted to DOEE for review when construction is completed.

When new plan sheets are required as part of a construction revision, the new plan sheets will include all relevant supporting information in accordance with Section 14.5.3.

14.5 Submittals
The DB Contractor shall coordinate, deliver, and process all drainage-related submittals to DDOT, DOEE, DC Water, CSXT, WMATA, and others, as required by the Design-Build Agreement (DBA). All draft, revised, and final plans, design calculations, technical reports, and shop drawing submittals shall be accurate, complete, and in a form and at a level of detail to enable DDOT to satisfactorily discharge its review and Approval obligations.

The DB Contractor shall provide all design documentation and construction documentation as both a hardcopy document and electronic files. These documents shall be deemed “received” by DDOT, thereby, triggering the applicable timeframe for review on submission of both the electronic files and hard copy documents, inclusive of all required information necessary to perform a complete review.

The DB Contractor will be required to provide seven hard copies of all submittal documents for DDOT reviews. Drawing submittals shall be complete with associated engineering documentation sufficient to verify that the design meets the Mandatory Standards, specifications, permits, and applicable agreements. In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

14.5.1 Summary of Submittals

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15 Visual Quality Requirements

15.1 General
The DB Contractor shall conduct all Work necessary to meet the requirements associated with visual quality, including provision of qualified personnel to ensure informed visual quality decisions that meet or exceed the standards for visual quality.

15.2 Performance Requirements

15.2.1 Environmental Compliance
The DB Contractor shall be responsible for ensuring that design for visual quality complies with the project commitments as established by the Environmental Documentation.

15.2.2 Context Sensitive Solutions
The DB Contractor shall develop the design for visual quality and conduct visual quality management work consistent with the principles established by DDOT’s Context Sensitive Design Guidelines and FHWA’s Context Sensitive Solutions toolbox (http://contextssensitivesolutions.org/content/topics/misc/fhwa-toolbox/) through using inclusive design approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. Context sensitive solutions shall be reached through a collaborative, interdisciplinary approach involving all Stakeholders.

15.3 Design Requirements

15.3.1 Visual Quality Elements
In developing the design for visual quality the DB Contractor shall follow and compliment the visual quality standards established by prior studies, reports, guidelines and plans including:

1. Metropolitan Branch Trail Art & Design Standards, DDOT, 2009
In addition to project design appearance goals set forth by the Environmental Documents, the following qualities shall be inherent in the overall design of the Project:

1. The design for the MBT shall integrate with the overall Project.
2. The design of adjacent open parcels of land shall integrate "greenscape" to the greatest extent possible, and the "greenscaping" shall blend with the surroundings.
3. The design shall coordinate the architectural character, surface treatments, and materials used on trails, retaining structures, curbs, lighting, railings and barriers so that a consistent standard or family of standards is used throughout the Project.
4. Define the special areas of the Project and address the architectural elements for each (e.g., trail paving and treatment, curbs, medians, lighting, furnishing, signage, street trees, planting and LID).
5. Streetprint treatments shall be used along the trail at important intersections of pedestrian and trail traffic.

15.3.2 Landscaping

All trees, shrubs, deciduous vines, and perennials shall comply with the applicable requirements of ANSI Z60.1 American Standard for Nursery Stock.

The DB Contractor shall use plant species suitable for the area and Project Site. Where possible, landscaping shall be utilized to improve storm water quality following the concept and objectives of Low Impact Development. The Developer shall consult with DDOT’s Urban Forestry Administration (UFA) for recommended plant species lists and the D.C. Department of Transportation – Design and Engineering Manual for information on landscaping design criteria (DEM-47).

All plantings installed outside the CSXT right-of-way shall not obstruct, in any way, proper signal preview by railroad engineers. There shall be no planting of trees or shrubs within the CSXT right-of-way.

15.3.2.1 Landscaping Plan

The DB Contractor shall assign a licensed landscape architect, with a minimum of 3 years’ experience in designing aesthetics and landscaping elements for trail projects of similar scope and size, to develop the landscaping plan. This plan shall provide guidelines and requirements for the landscape design of the Project including the following:

- the Project design shall minimize impact on the existing natural environment to the extent possible;
- existing trees and rock outcroppings shall be preserved to the greatest extent possible;
- the Project design shall emphasize and enhance the existing natural context and landscape to the fullest extent possible;
- all structures shall be carefully detailed so as to achieve the greatest level of aesthetic quality and fit within the Project context;
- color, texture, and form shall be considered in selecting appropriate planting material for continuity along the entire length of the Project;
15.3.3 Retaining Wall Aesthetic Treatment

The following special “green” aesthetic treatment shall be applied to the following potential retaining walls:

- approximately Sta. 116+10 to 117+20 and 123+25 to 127+40;
- any other retaining walls proposed on National Park Service (NPS) property;
- retaining walls with partial limits on NPS property shall be the same “green” treatment for the entire length of the wall.

“Green” retaining walls shall have a concrete coping at the top and evenly spaced concrete pilasters along the entire length of the wall. Spacing of pilasters shall be determined by the DB Contractor and submitted to DDOT for approval. The concrete coping shall be stained white to provide a color contrast between the pilasters and wall panels. The pilasters shall have an ashlar stone pattern formliner finish and the concrete shall be stained a sandstone color to produce a natural stone appearance.

Wall panels shall have a textured finish with a typical amplitude of approximately 3/8 inch and a maximum amplitude of 1/2 inch. Concrete texturing shall be in addition to the 2 inch concrete cover on reinforcing steel typically required. The concrete texture shall have a uniform appearance throughout the structure and shall be stained a sandstone color.

Deciduous vine parthenocissus quinquefolia (virginia creeper) and evergreen vine lonicera sempervirens (coral honeysuckle) shall be planted along the face of the retaining wall, as prescribed in Section 13 of these Technical Provisions, to provide year round visual interest. Vines shall be planted in groupings, with species alternating between every two pilasters.

The DB Contractor shall submit details of all aesthetic treatments to DDOT and NPS for review and approval prior to ordering any materials. Submittals shall include, but are not necessarily limited to the following:

- plan, elevation, and section drawings with all details of aesthetic treatment clearly delineated;
- sample of concrete color and texture for the wall panels;
- sample of concrete color and texture for coping;
- details of pilaster stone form liner and staining; and
- material cut sheets for the trellis.

15.4 Construction Requirements
15.4.1 Retaining Wall Aesthetic Treatment

Virginia creeper shall adhere itself to the textured wall surface and will not require any additional structural support. Virginia creeper shall be maintained to keep a 2 foot clearance from the coping and pilasters.

Coral honeysuckle is a twining vine and will require structural support. Provisions shall be made for the vegetation to climb the wall by attaching rigid three dimensional galvanized welded wire trellis panels to the wall. Panels shall be square and have a 2” X 2” face grid. The structure shall be coated and protected with a black oxide finish. Panel edges shall be finished with a smooth channel trim. The trellis shall be attached to the wall and installed per manufacturer’s instructions. There shall be a visual reveal between the coping, pilasters, and vegetated panels such that the coping overhangs the pilasters and the panels are recessed behind the pilasters.

15.4.2 Mock-ups and Samples

DB Contractor shall provide DDOT mock-ups and samples for Approval a minimum of 60 calendar days in advance of starting construction of the applicable item. At a minimum, the DB Contractor shall submit the following to DDOT.

- sample panels for all textured concrete surface finishes (including non-standard pavement), minimum size 5-ft by 5-ft

Sample panels shall be portable so they can be viewed on the site at different sun angles and times of day.

In addition, the DB Contractor shall provide full size samples of the following items before ordering material for construction.

- Sample wayfinding signs

15.5 Submittals

In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated within Section 1 of these Technical Provisions.

15.5.1 Summary of Submittals

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### 16 Illumination

#### 16.1 General

DB Contractor shall provide lighting for the entire length of the proposed trail alignment.

Existing lighting impacted by the Project shall be replaced in accordance with the requirements in this Technical Provision.

#### 16.2 Performance Requirements

DB Contractor shall provide lighting and electrical design and construction meeting the Mandatory Standards.

#### 16.3 Design Requirements

Lighting design shall be in accordance with:

- IES RP-8-14 Roadway Lighting.

#### 16.3.1 Photometric Design

DB Contractor shall submit to DDOT a Lighting Roll Plan depicting, at a minimum:

- Proposed pole locations and photometric analysis, showing point by point spacing calculations, with a maximum of 5 foot by 5 foot grid spacing. Designed to the following criteria:
  - Within WMATA property limits from stations 100+00 to 131+50, 150+90 to 152+00 and 201+50 to 208+50 shall be designed with a minimum of 3.0 footcandle horizontal average, 3:1 horizontal uniformity (average / minimum), 8:1 horizontal uniformity (maximum / minimum) and 0.20 minimum vertical footcandle. See Section 4 of WMATA Manual of

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Design Criteria.

- Outside WMATA property limits from Brookland Metro station to Bates Rd along John McCormack Dr shall be designed with a minimum of 2.0 foot candle horizontal average, 3:1 horizontal uniformity (average / minimum) and 0.20 minimum vertical footcandle.
- Horizontal calculations shall be measure at z = 0.
- Vertical calculations shall be measured at z = 5.
- Vertical calculations shall be performed in accordance with IES RP-8-14.
- DB Contractor shall utilize a maximum light loss factor of 0.80.

16.3.2 Service Drop and Utility Coordination

DB Contractor shall coordinate service drop locations with Potomac Electric Power Company (Pepco). Lighting feeds shall come directly from Pepco service drop locations. A separate lighting control cabinet will not be required.

16.3.3 Lighting Infrastructure/Electrical Design

Luminaires shall be mounted on standalone poles. A number of lighting poles shall be provided with camera surveillance equipment, see Section 17 for details. Lighting equipment shall be:

- Lighting fixture shall be Philips Domus DMS50-80W48LED-4K-R-LE55-VOLT-BKTX (55W LED, 4000K, Type II), or approved equal.
- Light pole shall be Philips APR4W-18-PH7/347-BKTX (or approved equal) and provide an 18’ mounting height.
- Lighting arm shall be MJ-1A-R4-BKTX, or approved equal.

Electrical design shall be in accordance with DDOT lighting standards and the National Electric Code. DB Contractor shall meet the following requirements electrical conduit and voltage drop.

- Maximum fill permitted for conduit shall be of 25%.
- Maximum voltage drop permitted in any circuit shall be of 3%. Voltage drop calculations shall be submitted to DDOT for review and comment.
- Conduit shall be direct buried PVC schedule 80.
- Electrical trunk line (2-4” conduit) shall run from manhole to manhole. Minimum allowable conductor and ground wire size for the trunk line shall be #8 AWG.
  - Electrical trunk line wire shall be type USE or RHW.

Lighting manholes shall be in accordance with DDOT standard 617.15.

Light poles shall be serviced by 1-2” conduit originating from electrical manhole, with three runs of #10 AWG wire. One run shall include green insulation and be connected to ground. Pole to pole connections are not permitted.

- #10 wires shall be type THHN/THWN.
- Each manhole shall service a maximum of 4 light poles.
Contractor shall design light pole foundation. A minimum of 2-2” conduit bends shall be installed in the foundation.

16.3.4 WMATA Lighting Impacts

DB contractor shall be responsible for the relocation of WMATA poles and lighting structures in conflict with the proposed trail, as shown in the concept lighting plans. DB Contractor shall coordinate with the Engineer and WMATA to confirm locations.

16.3.5 Solar Lights Along Segment 1D

DB Contractor shall remove and salvage existing solar lighting structure, solar panels and foundation. Foundation shall be removed completely. DB Contractor shall coordinate with Engineer to return to NPS.

16.3.6 Lighting Along John McCormack

DB contractor shall replace the existing High Pressure Sodium (HPS) luminaires (existing poles to remain) along John McCormack Dr from the Brookland Metro Station to Bates Rd NE with DDOT standard LED Philips 215W128LED4K-R (215W LED, 4000K, Type III), or approved equal, as shown in the concept plans.

16.4 Construction Requirements

All splices shall be located in the electrical manholes and fused. All splice kits shall be submersible. Splices for lighting cables shall not be permitted in the pole base.

16.5 Submittals

16.5.1 Summary of Submittals

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17 Security Cameras

17.1 General
DB Contractor shall conduct all work necessary to provide complete camera coverage for the entire length of the proposed trail alignment from station 101+00 to 131+50, 150+90 to 152+00 and 201+50 to 208+50. These limits generally encompass Segment 1A, 1B, and 1D.

17.2 Performance Requirements
DB Contractor shall provide complete surveillance coverage in accordance with Metropolitan Police Department (MPD) Crime Camera Standards for PTZ Camera and as modified herein. MPD Camera Standards are included in Volume II, Book 3 – Contract Data and Reports.

17.3 Design Requirements

17.3.1 Camera Configurations
DB Contractor shall provide one of two camera configuration:
1) AXIS M3027 PV-E AND AXIS Q6045-E MK II
2) AXIS Q6000-E AND AXIS Q6045-E MK II

17.3.2 Camera Mounting
Camera shall be mounted to pedestrian light pole arm, at a height of 15’. Camera arm shall be finished black textured RAL9005TX (BKTX). No stand-alone camera poles are permitted.

17.3.3 Control Cabinet
Control cabinet shall be mounted at a height of 4’, banded to the light pole. Cabinet shall meet the following specifications:

- NEMA 4X Rating Metal Enclosure Box.
- Minimum Dimensions: 26” (L) x 17” (H) x 15” (D)
- FAN: 80-100CFM / 115VAC / 0.20- 0.18AMP / 20Watt / 50-60HZ.
- HEATER: 30Watt /115VAC
- Temperature Sensor shall have: Normally-Open / 30- 140F range / 120VAC
- Temperature Sensor shall have: Normally-Closed / 30-140F range / 120VAC
- Furnished with 1in. or 2in. shrouds.

17.3.4 Uninterruptible Power Supply (Battery Backup)
Rechargeable UPS battery backup shall be installed in a separate enclosure from the Camera equipment. UPS enclosure shall have the following specifications:
- Side mounted to Camera Control Cabinet.
- Sized to provide battery backup pack with a minimum of 8 hour battery life.
- NEMA 4X Rating

### 17.3.5 Power Feed

Electrical power feed shall be in accordance with NEC and NESC recommendations. Cameras shall be powered 24 hours a day, 7 days a week, with the following configuration:

- DB Contractor shall splice streetlight circuit from adjacent DDOT lighting manhole.
  - Splice kits shall be submersible.
- DB Contractor shall furnish and install 2-#8 AWG + #8 Ground from lighting manhole to pole mounted camera control cabinet, in separate 2” conduit.
  - Conduit shall be Rigid PVC Schedule 80.
  - Conductor cables shall be type USE or RHW.
  - Ground wire shall be insulated stranded.

### 17.3.6 Communication Integration

DB Contractor shall coordinate with MPD to ensure cameras are fully integrated with MPD headquarters’ monitoring system.

### 17.3.7 Testing

DB Contractor shall submit a camera test procedure to the Engineer for approval. This test procedure shall include, but not limited to:

- Testing all features of the camera system
- Testing all communication equipment’s
- Factory Acceptance
- System Test
- Unit Test
- Final Acceptance

### 17.4 Submittals

#### 17.4.1 Summary of Submittals
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### 18 Signing and Wayfinding

#### 18.1 General
The Design-Build (DB) Contractor shall conduct all Work necessary to meet the requirements for permanent signing for the Project. Refer to Section 22 of these Technical Provisions for additional temporary signing requirements.

#### 18.2 Performance Requirements
The DB Contractor shall ensure all signing on the Project meets the requirements of the Mandatory Standards.

#### 18.2.1 Material Requirements
All signing Materials and supports shall be in accordance with the DDOT Design and Engineering Manual and the DDOT Standard Specifications for Highways and Structures.

#### 18.3 Design Requirements
The DB Contractor shall be responsible for including all regulatory, warning, and wayfinding signs in the permanent signing design. Final placement of all signs shall be determined by the DB Contractor in accordance with the Mandatory Standards.

#### 18.3.1 Permanent Signing
The DB Contractor shall replace all signs (sheeting and panel) within the Project Limits or affected by the Project that fail to meet the minimum reflective intensity requirements as defined in the DDOT Standard Specifications for Highways and Structures. This includes all signs affected by the Project.

The Permanent Signing Plans shall include, but are not limited to, the sign legend, the legend layout and spacing and the sign material requirements. Placement of the signs shall account for the required sight distances. All regulatory, warning and directional signs shall be shown at their proper locations. Each sign face shall be shown in close proximity to its respective sign with a leader line connecting the sign location and sign face. Each sign face shall be oriented on the plan sheet to be read as viewed from the direction of travel along the roadway. The location of all signs shall be indicated by station.

The DB Contractor shall coordinate with DDOT and other impacted agencies regarding proposed signing modifications within the city’s Right-of-Way (ROW).
The DB Contractor shall adjust all signage within the construction limits whose messages conflict with construction work.

The DB Contractor 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 DB Contractor shall present pertinent details – such as sign designs, mounting details, locations, etc. – for DDOT’s review and approval prior to relocation.

The DB Contractor shall perform line of sight analysis for all signs to confirm trail users and drivers have sufficient time to read the sign messages and ensure signs are not visually obstructed. Proposed sign posts shall be located so that proposed edge of sign panels are located a minimum of 2 feet from the edge of trail or shoulder and 7 feet from the surface of trail.

18.3.1.1 Permanent Signing Concept Plan Requirements
The DB Contractor shall prepare and submit a Permanent Signing Concept Plan for the Project. The Plan shall include all necessary, warning, regulatory, and wayfinding signs within the Project Limits. Additionally, the Permanent Signing Concept Plan shall provide for modifications to signs outside of the Project Limits that are rendered inaccurate, ineffective, confusing, or unnecessary by DDOT as a result of modifications by the Project. All sign panels shall be new.

The Permanent Signing Concept Plan shall include, but is not limited to, the following:

- Sign locations, including regulatory and wayfinding signs
- Panel legends
- Proximity to lighting and security devices
- Identification of all existing signs to remain or be removed

18.3.1.2 Permanent Signing Final Plan Requirements
The Permanent Signing Final Plans shall include, but are not limited to, the following items:

- Sign Specification Sheets containing all necessary fabrication (size, color, sheeting type), installation (mounting), station offset, relocation, and removal information for each sign.
- Design drawings showing the location of all new signs and existing signs to remain or to be removed. The drawings shall include the following:
  - Sign number referenced from Sign Specification Sheet.
  - Small-scale layout of all signs including guide, regulatory, warning, and object markers.
- Final pavement markings on the Permanent Signing Plans.
- Sign format plans (using Transoft GuidSign program, or similar format shall be used), including panel sizes; background and legend color; border width and corner radius; text height; font and character spacing; and sign numbers corresponding to the Sign Specification Sheets.
- Sign drawings (other than Standard Plans) showing details of sign mounting, foundations, base connections, and frames.
- Details for the modifications to signs outside of the Project Limits communicating accurate information addressing Project changes.
- All wayfinding signs and details necessary for the Project
18.3.2 Wayfinding Signs

The DB Contractor shall provide wayfinding signs consistent with the Metropolitan Branch Trail Art & Design Standards.

The DB Contractor shall be responsible for the manufacture and installation of the wayfinding signs, including all Materials necessary including post and foundations.

Wayfinding signage shall include directional and entrance signs to adjacent parks, school and other community destinations.

Wayfinding signs shall be shown on the permanent signing concept plans and permanent signing final plans described in this Section 18 of the Technical Provisions.

18.3.2.1 Specialized Signs

DB Contractor shall provide proposed signs meeting MUTCD standards with approval from DDOT. DB Contractor shall provide wayfinding signs which include Metro information shall indicate the color service line available and corresponding true and pantone color:

- Red – 185
- Green – 355
- Yellow – (True) Yellow

Wayfinding signs which include Metro information shall also use the standard WMATA Metro “M” symbol.

The National Park Service (NPS) shall provide specifications for the Fort Totten Park sign, located near Sta. 202+50, RT. The sign shall be placed in accordance with NPS “Guidsign” standards with the approval of NPS.

18.3.3 Aesthetics

The DB Contractor shall design and construct all Work in accordance with the DDOT Standard Specifications for Highways and Structures, NPS standards, WMATA standards, and the Metropolitan Branch Trail Art & Design Standards.

18.4 Construction Requirements

18.4.1 General

The DB Contractor shall perform a field inventory and show all existing signs within the Project limits. Existing single and multi-post sign assemblies impacted by construction shall be replaced entirely and upgraded to meet current standards. Existing sign assemblies not impacted by construction may remain.

All existing signs; new permanent signs installed as part of this Contract; and construction signs that are inappropriate for the traffic configuration at a given time shall be removed or completely covered an approved product specifically manufactured for sign covering during periods when they are not needed.

Per AASHTO standards, signs, structures, and foundations shall not encroach onto trail shoulders. The minimum distance of 3 feet shall be maintained between the edge of trail and closest portion of trail sign.

The DB Contractor shall use Materials Approved in accordance with Section 25 of these Technical Provisions.

Existing sign panels shall remain in place or shall be temporarily mounted until new or replacement signs are installed. New or replacement signs shall not be installed in a location that obscures the visibility of an
existing sign. Refer to Section 22 of these Technical Provisions for additional requirements and requirements related to temporary signing.

The DB Contractor shall not mount signs on top of retaining walls without prior Approval from DDOT.

18.4.2 Material Requirements
The DB Contractor shall supply new Materials for all sign posts and foundations. All metal sign posts shall be painted or powder-coated in accordance with the Metropolitan Branch Trail Art & Design Standards and the DDOT Standard Specifications for Highways and Structures.

18.5 Submittals
In addition to the requirements stated here-in, all submittals shall meet the requirements of these Technical Provisions. DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

18.5.1 Summary of Submittals

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19 Pavement Marking

19.1 General
The Design-Build (DB) Contractor shall conduct all Work necessary to meet the requirements for permanent pavement markings for the Project. Refer to Section 22 of these Technical Provisions for additional temporary pavement marking requirements.

19.2 Performance Requirements
The DB Contractor shall ensure that all pavement markings on the Project meet the requirements of the Mandatory Standards.
The DB Contractor shall provide and maintain pavement marking and reflective pavement markers meeting the Mandatory Standards.

19.3 Design Requirements
DB Contractor shall be responsible for providing pavement markings in accordance with the Mandatory Standards.
19.3.1 Permanent Pavement Markings
The DB Contractor shall be responsible for removing and replacing existing pavement marking in areas where temporary pavement marking will be used during construction. The DB Contractor shall eradicate existing pavement marking that conflict with proposed temporary markings and all reinstallation and restoration which may be required up to and including mill and overlay work. The DB Contractor will be required to replace the surface of existing pavement and install new pavement markings when any type of destructive method (visible pavement scarring present) is used to remove existing and/or temporary pavement markings.
On any pavement reconstruction undertaken by the DB Contractor, the DB Contractor shall tie-in and match the existing permanent pavement marking systems.

19.3.1.1 Additional Permanent Pavement Marking Requirements
DB Contractor shall provide crosswalks according to DDOT Standards at all locations of new ADA sidewalk curb ramps and all trail intersections with trail connections including stairs and ramps as described in Section 11 of these Technical Provisions. Crosswalks shall not be used in lieu of a stop line.
DB Contractor shall provide a centerline along the length of the trail as a 4-inch yellow dash line with a 1 to 3 segment to gap ration. A nominal 3-foot segment with a 9-foot gap shall be used.
DB Contractor shall provide trail edge lines when vertical obstructions are adjacent to the trail, and placed less than 2 feet horizontally from the edge of trail. Edge lines shall be 4-inch solid white lines and placed 1 foot inside the path edge. Vertical obstructions shall include barriers, fences, retaining walls or other longitudinal obstructions. Edge lines shall also be provided where the minimum buffer requirement is not being met, see Section 5 of these Technical Provisions for location.

19.3.2 Pavement Markings - Concept
The DB Contractor shall show proposed pavement markings on the same plan sheets as Permanent Signing Concept Plans, described in Section 18 of these Technical Provisions, that show the Project limits, basic information pertaining to trail geometrics, all tapers, lane shoulder, buffer widths, marking elements as outlined in Chapter 43 of the DDOT Design and Engineering Manual, and any other markings consistent with the needs of the Project.
The pavement markings provided on the Permanent Signing Concept Plans shall provide a basis for the pavement marking requirements for the Project. All pavement markings shall be clearly shown and labeled with their widths, color and spacing specified.

19.3.3 Pavement Markings - Final
The final design for pavement markings shall be shown on the Permanent Signing Final Plans, described in Section 18, and shall be prepared in accordance with the DDOT Design and Engineering Manual and shall at a minimum, include the following:

- All existing pavement marking for a minimum of 300 feet past the limits of construction, and adequate transition and tapers to maintain traffic at the design speed. Typical sections in lieu of plans will not be accepted.
- All new pavement marking by material type, color, and line width. The DB Contractor shall dimension the pavement marking across the roadway completely, tying the pavement marking to a construction center line or a monument line.
- Station and offset for all pavement arrows, legends, crosswalks, and miscellaneous pavement markings.
• Station and offset for the beginning and ending of all pavement markings and the beginning and ending of each taper. The DB Contractor shall locate the beginning and ending points of all curves and the associated radii.

• Design drawings, other than the Standard Plans, that show details of pavement markings, tapers, and transitions.

19.4 Construction Requirements

All pre-markings shall be temporary and of the same general color as the pavement markings being pre-marked. When tape is used as pre-marking, pre-marking shall consist of 4-inch by 4-inch maximum squares or 4-inch maximum diameter circles spaced at 25 feet minimum intervals. At locations where the pavement markings will switch colors—for instance, gore markings—the ends of the markings may be pre-marked regardless of the spacing.

No pre-markings shall be installed when the ambient air temperature is below 50 degrees Fahrenheit, and in no case will the removal of temporary lane markings require destructive measures including, but not limited to, burning or grinding from the permanent roadway surfaces.

19.4.1 Permanent Pavement Marking

The DB Contractor shall provide and apply all necessary control points for preliminary spotting and pavement marking layout on both the trail and affected adjacent roadways. Materials used for preliminary spotting and pavement marking layout shall be temporary. Refer to the DDOT Standard Specifications for Highways and Structures.

The DB Contractor shall not grind or blemish pavement after the final lift of pavement is applied.

19.4.2 Temporary Pavement Marking

Temporary striping shall be required prior to the reopening of a roadway or bikeway for travel where pavement or permanent striping cannot be completed due to construction staging, weather, or time constraints.

19.4.3 Replacement of Unsatisfactory Pavement Markings

The DB Contractor shall remove and replace pavement markings that fail to meet any of the criteria established in the DDOT Standard Specifications for Highways and Structures. In the event that the Work required to remove and replace unsatisfactory pavement would result in the marring or scarring of final pavement surface, the Contractor shall be required to perform a mill and overlay of the impacted area. The decision to require a mill and overlay will be made at DDOT’s sole discretion.

19.5 Submittals

In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

19.5.1 Summary of Submittals

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District Department of Transportation
### 20 Pavement

#### 20.1 General

The Design-Build (DB) Contractor shall perform all Work necessary to design and construct pavements required to complete the Project. The term pavement, or pavement section, shall be defined as the entire pavement structural section, including Hot Mix Asphalt (HMA), Porous HMA, Warm Mix Asphalt (WMA), base, and sub-base material. The DB Contractor shall review the geotechnical information included in the Geotechnical Data Report (GDR) and perform geotechnical explorations, geotechnical analyses, and laboratory testing sufficient to supplement the existing data as required.

Elements of Work shall include, but are not limited to, the following:

1. Constructing new pavement for all trails required to complete the Project
2. Reconstructing pavement by removing the existing pavement section and replacing with a new pavement section
3. Resurfacing existing HMA pavements

#### 20.2 Performance Requirements

##### 20.2.1 Trail Pavement

The surface treatment for the bike and pedestrian paths shall be in accordance with the requirements in Section 15 of these Technical Provisions.

Pavement for the trail shall be pervious HMA pavement per the pavement sections provided under Design Requirements of Section 20 of these Technical Provisions. The DB Contractor may submit an Alternate Pavement Design for Review and Approval by DDOT meeting DDOT Green Infrastructure Design Standards.

##### 20.2.2 Subgrade Drainage

The DB Contractor shall ensure that all new pavement sections have adequate subgrade drainage. Adequate subgrade drainage is defined as: a path perpendicular to centerline which allows water to flow through the base-course layer into a subgrade underdrain. Longitudinal underdrains shall be provided at the low side of the trail pavement section as necessary to convey subgrade drainage. Longitudinal underdrains shall be

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outlet according to DDOT Standard Specifications. Underdrain pipes shall be a minimum of 6 inches in diameter.

20.2.3 Repair of Damaged Pavement
The DB Contractor shall repair any pavement damaged during construction. The damaged pavement shall be replaced with new pavement to pre-construction condition or better. Damaged pavement and sidewalks shall be replaced to DDOT’s standards. The DB Contractor shall conduct a pre-condition survey to include existing pavement as described in Section 5 of these Technical Provisions.

20.3 Design Requirements
New porous and temporary pavement shall be designed and constructed in accordance with the DDOT Design and Engineering Manual, the DDOT Green Infrastructure Standards, AASHTO requirements, the Standard Specifications, and requirements specified herein.
20.3.1 Minimum Pavement Sections
The Trail pavement type shall be flexible porous pavement. Any Trail Alternate Pavement Designs shall be provided to DDOT with design inputs and supporting calculations, including design life calculations. A minimum 25-year design life shall be used for all Trail Alternate Pavement Designs.

The uppermost 1-ft of subgrade shall meet the pavement design minimum CBR value for permeable pavement and shall extend laterally from the edge of pavement to the shoulder break.

20.3.1.1 Trail Pavement Section
Trail pavement shall extend for the entire width of the Trail as prescribed in Section 23 of these Technical Provisions. All Trail pavements shall meet at a minimum the following criteria:
- **Surface Course**: 1.5-inch porous asphalt surface course – HMA 12.5mm
- **Base Course**: 3-inch porous asphalt base course – HMA 25mm
- **Choker layer**: 4-inch AASHTO #57 or approved equivalent
- **Reservoir layer**: AASHTO #3, #2 or #57 or approved equal to a depth sized to address stormwater management and conveyance requirements
- **Infiltration sump**: 1-inch
- **Filter layer**: 4-inch AASHTO #8 or approved equivalent
- **Subgrade**: uncompacted subgrade for areas design for infiltration practices. For other areas, subgrade shall meet current approved DDOT specification for “Aggregates for Permeable Pavement and Bioretention.”

20.3.1.2 Shoulder Pavement Section
Where Trail shoulders are provided along the alignment, the shoulder pavement section shall be a stabilized shoulder consisting of a 4 inch aggregate and topsoil mix. Aggregate, topsoil and seeding shall meet DDOT Standard Specifications for Highways and Structures.

20.3.1.3 Temporary Pavement for Detours and Maintenance of Traffic
DB Contractor shall design temporary pavement to meet field conditions and all temporary pavements shall be removed by the DB Contractor in their entirety when no longer needed.

20.3.2 Unsuitable Soils
Any material for use in the following locations that meets the requirements defined below shall be deemed unsuitable. Locations:

1. Material for use as embankment fill;
2. In cut areas within a depth of 1-ft below pavement subgrade;
3. Within 2 feet beneath the bedding of minor structures and 2 feet beyond the normal excavation limits on either side of minor structures;
4. Extending laterally from the edge of pavement for a distance of 2 feet; or
5. One foot from the back face of curb or curb and gutter, or to the shoulder break, whichever distance is furthest from the edge of pavement.

Requirements:

1. Material classified as CH, MH, OH and OL in accordance with the Unified Soil Classification System (USCS);
2. Material that contains more than 5 percent by weight organic matter;
3. Material that exhibits a swell greater than 5 percent as determined from the CBR test;

4. Material that exhibits strength, consolidation or any other characteristics that are deemed unsuitable by the DB Contractor’s geotechnical engineer or as denoted in the Contract Documents for use in the Work.

All materials within the uppermost 1-ft of the pavement subgrade that exhibits a CBR or resilient modulus value less than that stipulated in the DB Contractor’s pavement design shall also be considered unsuitable. Saturated or very dry and/or loose or very soft coarse and fine-grained soils that exhibit excessive pumping, weaving, or rutting under the weight of construction equipment are also considered unsuitable unless they can be moisture conditioned through either mechanical or chemical means to an acceptable moisture content that allows adequate compaction to meet Project specifications, and classification testing indicates they are not otherwise unsuitable. Topsoil, peat, coal, and carbonaceous shale should also be considered unsuitable material.

Unsuitable materials shall be legally disposed offsite. Unsuitable materials and methods of treatment shall be identified on the plans and cross sections. The DB Contractor’s geotechnical engineer shall inspect pavement subgrade immediately before placement of aggregate base, subbase, or bedding materials to identify excessively soft or saturated soils that exhibit pumping, weaving, or rutting under the weight of the construction equipment. Such soils are considered unsuitable and must be removed or modified in place to provide adequate support for pavement subgrade.

### 20.4 Construction Requirements

The pavement shall be constructed in accordance with the DDOT Standard Specifications for Highways and Structures, the DDOT Green Infrastructure Standards, Supplemental Specifications, Standard Drawings, and applicable special provisions.

#### 20.4.1 Trail Shoulder

The shoulder area shall be scarified to a depth of 4 inches reducing all clumps and sod to a maximum size of 4 inches. The topsoil aggregate mix shall be a 50-60 percent aggregate and 40-50 percent topsoil mix by volume. The aggregate and topsoil shall be pre-mixed into a uniform mixture before placing. After placement of the aggregate and topsoil mixture, prior to compaction, the area shall be covered with a dry seed mixture.

The maximum density of the mixture shall be determined by AASHTO T 99 Method C and mixture shall be compacted to at least 90 percent of the maximum density. After compaction, the shoulder area shall be dry seeded a second time.

### 20.5 Submittals

In addition to the requirements stated here-in, all submittals shall meet the requirements of Section 12 and Section 28 of these Technical Provisions.

DDOT will respond to DB Contractor submittals within the time frames stated in Section 1 of these Technical Provisions.

#### 21.5.1 Summary of Submittals

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<td>20.3</td>
<td>Pavement Designs</td>
<td>Review and Comment</td>
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Attachment 7A
DDOT Special Provision for HMA Production
and Construction Acceptance
Attachment 7A

DDOT Special Provision for HMA Production and Construction Acceptance

The Standard Specifications are amended by the following modifications and additions and shall prevail over requirements published in the Standard Specifications.

February 28, 2014

(a) Material Production – Tests and Evaluations.

The Engineer will conduct acceptance tests and will base acceptance on the DDOT acceptance test results, i.e. the asphalt cement quality, the Contractor’s QC Plan work, and the comparisons of the acceptance test results to the QC test results. The Engineer may elect to utilize test results of the Contractor in some situations towards judging acceptance. All acceptance tests shall be performed by qualified technicians at qualified laboratories following AASHTO procedures and shall be evaluated using Percent within Limit.

The Contractor shall supply, capture, and mark samples, as directed, from delivery trucks before the trucks leave the production plant. The sample size shall represent the material produced by the Contractor and shall be of sufficient size to allow the Engineer to complete all required acceptance tests. The Engineer will direct the Contractor when to capture these samples on a statistically random basis, and the sample will be immediately collected by the Contractor as directed by the Engineer. The captured sample shall be from the Engineer-specified delivery truck. If the Contractor visually observes the specified delivery truck sample and does not want this sample to be tested for acceptance, that delivery truck will be considered rejected and will not be sent to a Department project. The next visually acceptable delivery truck to the Contractor shall be sampled for acceptance testing.

The first acceptance test sample of the production Day will be randomly generated by the Engineer between 1 – 250 tons. Subsequent samples will be randomly generated by the Engineer on 500-ton sub-lots for the production Day. Insufficient or segregated samples may be a basis for rejection of material if the QC plan is not followed during the sample retrieval process.

If the Contractor desires to perform parallel testing with the Engineer, or to capture samples to be retained for possible Dispute Resolution, each of the samples for these purposes shall be obtained at the same time and location as the acceptance test sample. Either splitting a large sample or getting multiple samples that equally represent the material is acceptable. The Engineer will perform all splitting and handling of samples after they are obtained by the Contractor. The Engineer will collect all samples that are retained for possible Dispute Resolution.

The Engineer will evaluate and accept the material on a lot basis. All the material within a lot shall have the same JMF (mixture ID). The lot size shall be targeted for 2000 tons or a maximum period of three consecutive production Days, whichever is reached first. If the 2000th ton target lot size is achieved during a production day, the lot size shall extend to the end of that production day. The Contractor may stop the production of current approved mix in order to produce a different mix; this type of interruption will not alter the determination of the size or limits of the HMA mixture. The Engineer will evaluate each lot on a sub-lot basis. For each sub-lot, the Engineer will evaluate one sample, and the testing for each sub-lot will be completed on a daily basis.

The target size of a sub-lot within each lot, except for the first sample of the production Day, is equal-sized, 500-ton sub-lot and will be based upon anticipated production; however, more or fewer sub-lots, with
differing sizes, may result due to the production schedule and conditions. If the actual production is less than anticipated and it is determined a sample will not be obtained (based upon the anticipated tonnage), the Engineer will determine a new sample tonnage on a statistically random, unbiased basis based upon the new actual production. If the actual tonnage production is to be 10 percent more than the original anticipated daily tonnage, the Engineer will generate a new randomly selected tonnage value.

If the Engineer is present and the quantity exceeds 25 tons, a statistically random sample will be used for analysis. When the anticipated production is less than 100 tons and greater than 25 tons and the Engineer is not present, the Contractor shall randomly select a sample using the Engineer’s random location program. The captured sample shall be placed in a suitable box, marked to the attention of the Engineer, and submitted to the Engineer for testing. A box sample shall also be obtained by the Contractor at the same time and will be used as the Dispute Resolution sample if requested by the Engineer. The Contractor shall also obtain one liquid asphalt sample (1 pint) per grade of asphalt used per day and properly label it with all pertinent information.

The Engineer will conduct the following tests in order to characterize the material for the pavement compaction quality and to judge acceptance and the pay adjustment for the material:

1. AASHTO T312 – Preparing a mixture sample using a gyratory compactor.
2. AASHTO T166 – Bulk specific gravity of compacted samples.
3. AASHTO T308 – Asphalt cement content.
4. AASHTO T30 – Aggregate gradations, using samples from the asphalt cement content test.
5. AASHTO T209 – Theoretical maximum specific gravity.

(b) Pavement Construction – Tests and Evaluations.

The Engineer will directly base acceptance on the compaction acceptance test results and on the inspection of the construction, ride smoothness as referenced in the Contract Documents, lift thickness as referenced in the Contract Documents, joint quality as referenced in the Contract Documents, surface texture as referenced in the Contract Documents. For the compaction acceptance testing, the Engineer will sample the work on a statistically random basis and will test and evaluate the work using lots.

Prior to paving a road segment, the Contractor shall notify the Engineer of any locations within that road segment that may not be suitable to achieve required compaction due to existing conditions. The Contractor shall schedule and hold a meeting in the field with the Engineer in order to discuss all areas that may potentially be applicable to Table 3 before paving starts. Areas of allowable exemptions that will not be cored include the following: partial-depth patch areas, driveway entrances, areas around manholes and driveway entrances, and areas of paving that are under 100 feet in continuous total length and/or 5 feet in width.

The exempt areas around manholes will be a maximum of 4 feet transversely on either side from the center of the manhole and 8 feet longitudinally on either side from the center of the manhole. The exempt areas around driveway entrances shall be the entire width of the driveway and 3 feet from the edge of the longitudinal joint next to the driveway. Areas of exemption that will be cored for informational purposes only shall include: areas where the mat thickness is less than three times the nominal maximum aggregate size. Failure to obtain core samples in these areas will result in zero payment for compaction regardless of the exempt status.
The Engineer will evaluate and accept the compaction work on a daily basis. Payment for the compaction will be calculated by using the material production lots as referenced in the Acceptance Plan (a) Material Production – Tests and Evaluation and analyzing the compaction results over the individual Days covered in the material production lot. The compaction results will be combined with the material results to obtain a payment for this item.

The minimum size of a compaction lot shall be 100 tons. If the compaction lot is between 101 and 1000 tons, the Engineer shall randomly determine four compaction acceptance test locations. If the compaction lot is between 1001 and 1500 tons, the Engineer shall randomly determine six compaction acceptance test locations. If the compaction lot is between 1501 and 2000 tons, the Engineer shall randomly determine eight compaction acceptance test locations. If the compaction lot is greater than 2000 tons, the Engineer shall randomly determine two compaction acceptance test locations per 500 tons.

If a randomly selected area falls within an Engineer-Approved exemption area, the Engineer will select one more randomly generated location outside the exempt area to be tested per the requirements of this Specification. If that cannot be accomplished, or if an entire location has been declared exempt, the compaction testing shall be performed as per these Specifications, but a note will be added to the results that the location was an Engineer-Approved exempt location.

Testing locations will be a minimum of ± 0.5 feet from the newly placed longitudinal joint. If the Contractor chooses to cut companion cores, they shall be located within one (1) foot of the Engineer’s cores along the longitudinal direction and in-line with the Engineer’s cores in the longitudinal plane.

Exactly at the locations marked by the Engineer, the Contractor shall cut a core, 4 inches in diameter, through the full lift depth. Cores submitted that are not from the location designated by the Engineer will not be tested and will be paid at zero pay.

The Contractor shall notify the Engineer prior to starting paving operations with approximations of the tonnage to be placed. The Contractor is then responsible for notifying the appropriate Engineer test personnel within 24 hours of material placement. The Engineer will then have 24 hours to mark the core locations. After determination of locations, the Contractor shall complete testing within two operational Days of the locations being marked. The Engineer will witness the coring operation and take immediate possession of the cores. If the cores are not cut within two operational Days, the area in question will be paid at zero pay for compaction testing.

The Contractor shall provide any traffic control required for the structural number investigation, sampling, and testing work at no additional cost to the Department.

The Contractor shall cut each core with care in order to prevent damaging the core. The pavement shall have a maximum temperature of 140 degrees F when cores are cut from it. Immediately upon removal of a core from the roadway, the Contractor shall adequately label it. The Contractor shall protect the core by supplying a 4-inch plastic concrete cylinder mold, or an approved substitute, and placing the core in it. If more than one core is in the same mold, the Contractor shall place paper between them. The Contractor shall attach a completed QC test record for the representative area to the corresponding core. The Engineer will also complete a test record for areas tested for the QA report and provide to DDOT QA/QC Division.

The Contractor shall repair the core hole per Appendix A, Repairing Core Holes in Hot-Mix Asphalt Pavements. Core holes shall be filled immediately. Failure to repair core holes at the time of coring will result in zero pay for compaction testing for the area in question.

The Engineer will conduct the following tests on the applicable portion of the cores in order to evaluate their quality:

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Metropolitan Branch Trail RFP

1. AASHTO T166, Method C (Rapid Method) – to determine the bulk specific gravity of the cores.

2. AASHTO T209 – to calculate the theoretical maximum specific gravity and the density of the non-compacted mixtures.


The Engineer will use the average of the last five test values of the same JMF (mixture ID) material at the production plant in order to calculate the average theoretical maximum specific gravity of the cores. The average will be based on the production Day’s test results and as many test results needed from previous Day’s production to have an average of five samples. If there are less than five values available, the Engineer will use the JMF design value in addition to the available values to calculate the average theoretical maximum specific gravity.

Payment and Pay Adjustment Factors

The Contractor shall include the costs for all materials, labor, equipment, tools, and incidentals necessary to meet the requirements of this Specification in the bid price per ton for the hot-mix asphalt. Payment to the Contractor for the hot-mix asphalt item(s) will be based on the Contract price per ton and the pay adjustments described in this Specification. The Engineer will determine pay adjustments for the hot-mix asphalt item(s) based on the Acceptance Plan. The Engineer will determine both a pay adjustment for the material and a pay adjustment for the pavement construction. Note that the material portion of the total pay adjustment is 70 percent and the pavement construction portion is 30 percent. For replaced material or work, the Engineer will not apply the pay adjustment applicable to the material or work replaced; a new pay adjustment will be calculated based on the qualities of the new material. Even if one portion of the pay adjustment (material or construction) is not applied, the Engineer may apply the pay adjustment to the other portion. All adjustments (bonus or penalty) shall be paid under this item number in the Contract.

(a) Material Production – Pay Adjustment.

The Engineer will determine the material pay adjustment by evaluating the production material based on the following parameters:

1. Gradation of the 2.36 mm (#8) sieve.

2. Gradation of the 0.075 mm (#200) sieve.

3. Asphalt-cement content.

4. Air-void content

Using the JMF target value, the single test tolerance (from Table 2), and the test values, the Engineer will use the following steps to determine the material pay adjustment factor for each lot of material:

1. For each parameter, calculate the mean value and the standard deviation of the test values for the lot to the nearest 0.1 unit.

2. For each parameter, calculate the Upper Quality Index (QU): QU = ((JMF target) + (single test tolerance) – (mean value)) / (standard deviation).

3. For each parameter, calculate the Lower Quality Index (QL): QL = ((mean value) - (JMF target) + (single test tolerance)) / (standard deviation).
4. For each parameter, locate the values for the Upper Payment Limit (PU) and the Lower Payment Limit (PL) from Table 1 – Quality Level Analysis by the Standard Deviation Method. (Use the column for “n” representing the number of sub-lots in the lot. Use the closest value on the table when the exact value is not listed).

5. Calculate the PWL for each parameter from the values located in the previous step: \( PWL = PU + PL - 100 \).

6. Calculate each parameter’s contribution to the payment adjustment by multiplying its PWL by the weight factor shown in Table 2 for that parameter.

7. Add the calculated adjustments of all the parameters together to determine the Composite PWL for the lot.

8. Calculate the pay adjustment factor (PF) by the following formula: \( PF = 55 + 0.5 \times PWL \)

9. For each lot, determine the final material price adjustment:

\[
\text{Final Pay Adjustment} = (\text{Lot Quantity}) \times (\text{Item Bid Price}) \times (\text{Pay Adjustment Factor}) \times 70\%.
\]

In lieu of being assessed a pay adjustment penalty, the Contractor may choose to remove and replace the material at no additional cost to the Department. If the PWL of any single material characteristic is below 60, the Engineer may require the removal and replacement of the material at no additional cost to the Department.

The test results from the Engineer on production that is less than 100 tons will be combined with the two most recently completed Engineer tests with the same Mixture ID to calculate payment for the lot encompassing the single test. If that cannot be accomplished, the approved JMF will be used to calculate payment for the lot encompassing the single test. Payment for previously closed lots will not be affected by the analysis.

When a sample is out of the acceptable tolerance for any Materials pay criteria, that sample will be isolated. For payment purposes, the test result of the out of acceptable tolerance sample will be combined with the two previous acceptable samples of the same JMF and analyzed per this Specification. The material that is considered out of the acceptable tolerance will only include the material within the represented sub-lot (i.e., a maximum of 500 tons). If the previous acceptable test result is from the previous production Day, only the material produced on the second production Day will be considered out of tolerance. All future sub-lots will not include the isolated test.

If, during production, a QA sample test result does not meet the acceptable tolerances and the Contractor’s QC sample duplicates the QA sample test result, the Contractor can make an appropriate change to the mixture (within the JMF boundaries) and request to have that sample further isolated. If this request is Approved and the Contractor has made a change, the third load after the change will be tested. If that sample test result shows compliance with the specifications, the material that is considered out of the acceptable tolerance will include the material from the previous acceptable test result to the third load after the initially sampled and tested sample. If the sample does not meet the specification requirements, the Engineer will no longer accept material; Production may resume when changes have been made and an acceptable sample and test result is obtained.
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Quality Level Analysis by the Standard Deviation Method

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(b) Pavement Construction – Pay Adjustments.

The Engineer will determine the pavement construction pay adjustment by evaluating the construction of the pavement, based on the degree of compaction of the in-place material. Using the test values for the cores, the Engineer will use the following steps to determine the pavement construction pay adjustment for each lot of work. Note that the material portion of the total pay adjustment is 70 percent, and the pavement construction portion is 30 percent.

1. Calculate the average density values from the sub-lot tests values to the nearest 0.1 unit.

2. Calculate the Degree of Compaction: Degree of Compaction = ((Core Bulk Specific Gravity) / (Theoretical Maximum Specific Gravity)) x 100%.

3. The average compaction for the sub-lots shall be averaged together for the compaction level of the lot. The lot’s compaction test level shall be averaged to the whole percent.

---

TABLE 2

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<td>0.30</td>
</tr>
</tbody>
</table>
4. Locate the value of the Payment Adjustment Factor corresponding to the calculated degree of compaction from Table 3 or Table 3(a).

5. Determine the pavement construction price adjustment by using the following formula:

6. Pay adjustment = (Lot Quantity) x (Bid Price) x (Pay Adjustment Factor) x 30%.

**TABLE 3**  
Compaction Price Adjustment Surface Course Mixes

<table>
<thead>
<tr>
<th>Degree of Compaction (%)</th>
<th>Pay Adjustment Factor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥99.0</td>
<td>-100*</td>
</tr>
<tr>
<td>98.0</td>
<td>-10</td>
</tr>
<tr>
<td>97.0</td>
<td>-3</td>
</tr>
<tr>
<td>96.0</td>
<td>0</td>
</tr>
<tr>
<td>95.0</td>
<td>0</td>
</tr>
<tr>
<td>94.0</td>
<td>0</td>
</tr>
<tr>
<td>93.0</td>
<td>0</td>
</tr>
<tr>
<td>92.0</td>
<td>0</td>
</tr>
<tr>
<td>91.0</td>
<td>-15</td>
</tr>
<tr>
<td>90.0</td>
<td>-25</td>
</tr>
<tr>
<td>89.0</td>
<td>-30</td>
</tr>
<tr>
<td>88.0</td>
<td>-100*</td>
</tr>
</tbody>
</table>

*or remove and replace at Engineer’s discretion.

**TABLE 3(A)**  
Compaction Price Adjustment Base Course Mixes

<table>
<thead>
<tr>
<th>Degree of Compaction (%)</th>
<th>Pay Adjustment Factor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥98.0</td>
<td>-100*</td>
</tr>
<tr>
<td>97.0</td>
<td>-10</td>
</tr>
<tr>
<td>96.0</td>
<td>-3</td>
</tr>
<tr>
<td>95.0</td>
<td>0</td>
</tr>
<tr>
<td>94.0</td>
<td>0</td>
</tr>
<tr>
<td>93.0</td>
<td>0</td>
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<tr>
<td>92.0</td>
<td>0</td>
</tr>
<tr>
<td>91.0</td>
<td>0</td>
</tr>
<tr>
<td>90.0</td>
<td>0</td>
</tr>
<tr>
<td>89.0</td>
<td>-15</td>
</tr>
<tr>
<td>88.0</td>
<td>-30</td>
</tr>
</tbody>
</table>
Dispute Resolution

Disputes or questions about any test result shall be immediately brought to the attention of the Contractor and the Engineer. When there is a significant alleged discrepancy regarding the Engineer’s acceptance test results, the Contractor must claim a dispute within two operational Days of the test date. The following Dispute Resolution procedures will be used.

The Engineer and the Contractor will review the sample quality, the test method, the laboratory equipment, and the laboratory technician. If these factors are not the cause of the dispute, a third-party Dispute Resolution will be used.

For third-party resolution testing, it can be either the Engineer’s laboratory or an independent accredited laboratory. Unless otherwise mutually agreed upon by the Engineer and Contractor, the Engineer’s qualified laboratory in DDOT Materials & research laboratory and qualified personnel shall conduct the necessary testing for third-party Dispute Resolution after the Engineer has provided reasonable notice to allow the Contractor to witness this testing.

When disputes over production testing occur, the samples used for Dispute Resolution testing will be those samples the Contractor properly captured, labeled, and the Engineer stored, as described in the second paragraph of the section of these specifications titled, Acceptance Plan, (a) Material Production – Tests and Evaluations. If no samples are available, the original testing results will be used for payment calculations.

If there is a discrepancy between the Engineer’s acceptance test result and the Contractor’s test result, the Contractor may ask for the Dispute Resolution sample to be tested. If the Dispute Resolution sample substantiates the original acceptance test result, the Contractor, after two such Dispute Resolution samples, will be charged a fee of $125 for all further Dispute Resolution cores that substantiate the acceptance test result. If the Dispute Resolution sample substantiates the Contractor’s test result, the Contractor will not be charged a fee.

When disputes over compaction core test results occur, the Engineer’s acceptance core will be used for the Dispute Resolution sample. The Contractor will be advised on when the testing will occur as referenced above to witness the testing.

The results of the Dispute Resolution testing shall replace all of the applicable disputed test results for payment purposes.

<table>
<thead>
<tr>
<th>Degree of Compaction (%)</th>
<th>Pay Adjustment Factor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>87.0</td>
<td>-100</td>
</tr>
</tbody>
</table>

*or remove and replace at Engineer’s discretion.
Appendix A

Repairing Core Holes in Hot-Mix Asphalt Pavement

Description
This appendix describes the procedure required to acceptably repair core holes in a bituminous concrete pavement.

Materials and Equipment
The following material shall be available to complete this work:
1. Patch Material – A DDOT-approved Cold Patch material shall be used.
2. The following equipment shall be available to complete this work:
3. Sponge or other absorbent material – Used to extract water from the hole.
4. Compaction Hammer – Shall be mechanical, with a flat, circular tamping face smaller than 4 inches in diameter. The tamping head shall be connected to an electrical, pneumatic, or gasoline-driven tamping device.

Construction Method
After core removal from the hole, remove all excess water from within the hole, and prevent water from re-entering the hole.

Place the patch material in lifts no greater than 3 inches. If the hole is deeper than 3 inches, use two lifts of approximately equal depths so that optimum compaction is achieved. Make sure that the patch surface matches the grade of the existing roadway. Make every effort to achieve the greatest possible compaction

Performance Requirements
1. The Engineer will judge the patch on the following basis:
2. The patch shall be well compacted;
3. The patch surface shall match the grade of the surrounding roadway surface.

Basis of Payment
No measurement or payment will be made for the patching work. The Contractor must gain the Engineer’s acceptance of the patching work before the Engineer will accept the material represented by the core.