

Response to Request for Proposals

ROUTE 7 AND BATTLEFIELD PARKWAY INTERCHANGE

Town of Leesburg, Virginia

State Project No.: 0007-253-109, P101, R201, C501, B601

Federal Project No: STP-5A01(704)

Contract ID Number: C00106573DB101

VOLUME I: TECHNICAL PROPOSAL



SUBMITTED BY:



IN ASSOCIATION WITH:



ATTACHMENT 4.0.1.1 – Addendum No. 1

Route 7 and Battlefield Parkway Interchange

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Offerors shall furnish a copy of this Technical Proposal Checklist, with the page references added, with the Technical Proposal.

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Technical Proposal Checklist and Contents	Attachment 4.0.1.1	Section 4.0.1.1	no	NA
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.6 (Form C-78-RFP)	Sections 3.6, 4.0.1.1	no	NA
Letter of Submittal	NA	Sections 4.1		1
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	1
Identify the full legal name and address of Offeror	NA	Section 4.1.1	yes	1
Authorized representative's original signature	NA	Section 4.1.1	yes	1
Declaration of intent	NA	Section 4.1.2	yes	1
120 day declaration	NA	Section 4.1.3	yes	1
Point of Contact information	NA	Section 4.1.4	yes	1
Principal Officer information	NA	Section 4.1.5	yes	1
Interim Milestone and Final Completion Date(s)	NA	Section 4.1.6	yes	1
Unique Milestone Date(s)	NA	Section 4.1.7	yes	1
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.8	no	Appendix
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	Section 4.1.9	no	Appendix
Written statement of percent DBE participation	NA	Section 4.1.10	yes	1

ATTACHMENT 4.0.1.1 – Addendum No. 1

Route 7 and Battlefield Parkway Interchange

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Offeror's Qualifications				
	NA	Section 4.2		2-3
Confirmation that the information provided in the SOQ submittal remains true and accurate or indicates that any requested changes were previously approved by VDOT	NA	Section 4.2.1	yes	2
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	3
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	NA
Design Concept				
	NA	Section 4.3		4-19
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	5-14
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	15-17
Project Approach				
	NA	Section 4.4		20-39
Environmental Management	NA	Section 4.4.1	yes	20-24
Utilities	NA	Section 4.4.2	yes	25-28
Geotechnical	NA	Section 4.4.3	yes	28-31
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	31-39
Construction of Project				
	NA	Section 4.5		40-57
Sequence of Construction	NA	Section 4.5.1	yes	40-47

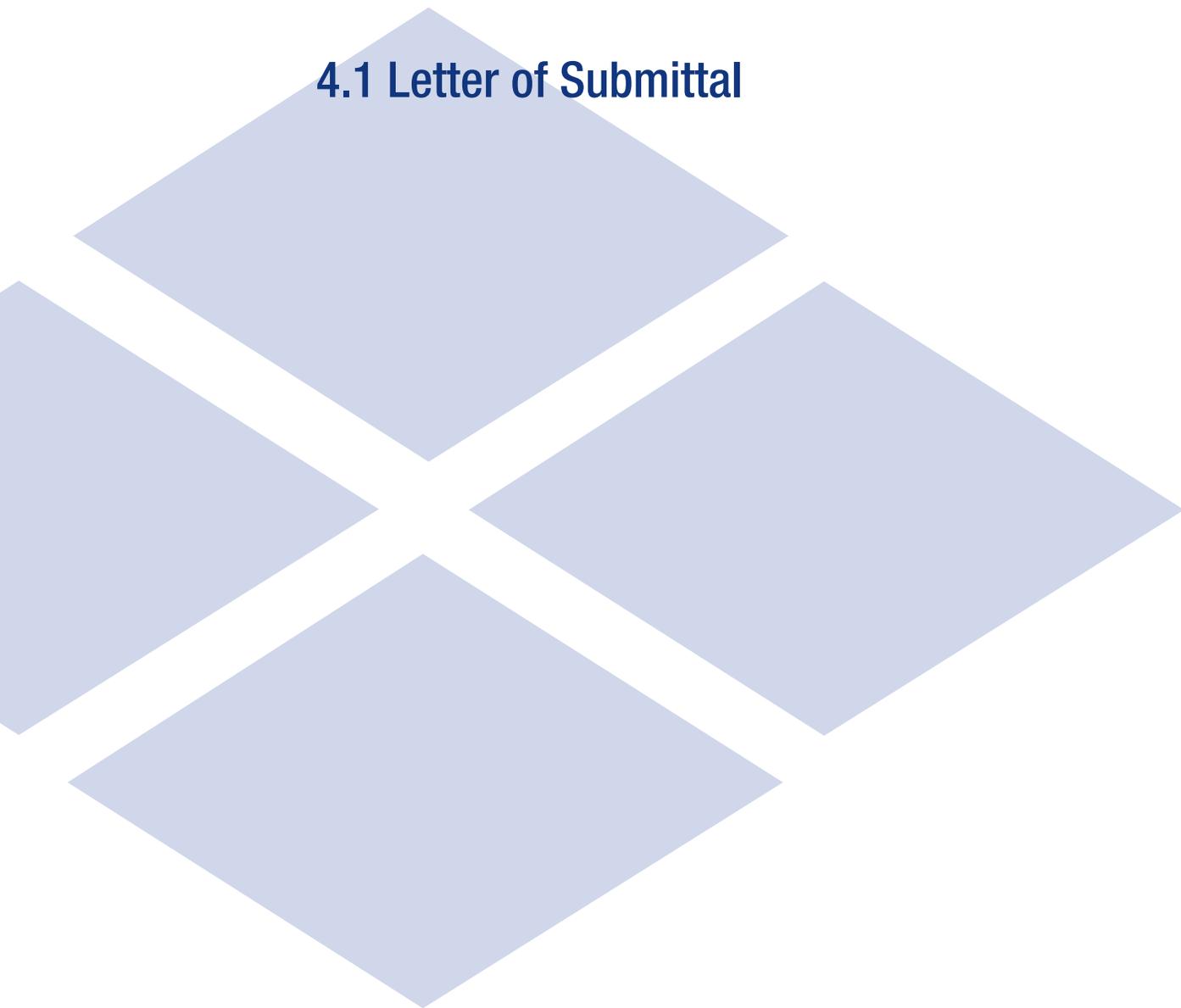
ATTACHMENT 4.0.1.1 – Addendum No. 1

Route 7 and Battlefield Parkway Interchange

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Transportation Management Plan	NA	Section 4.5.2	yes	51-57
Proposal Schedule	NA	Section 4.6		NA
Proposal Schedule	NA	Section 4.6	no	NA
Proposal Schedule Narrative	NA	Section 4.6	no	NA
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.6	no	NA

4.1 Letter of Submittal





November 27, 2018

Mr. Stephen D. Kindy, P.E.
Alternative Project Delivery Division
Virginia Department of Transportation
1401 East Broad Street
Annex Building, 8th Floor
Richmond, Virginia 23219

**RE: Route 7 and Battlefield Parkway
Interchange Design-Build Project
Project No.: 0007-253-109
Contract ID Number: C00106573DB101
4.1 Letter of Submittal**

Dear Mr. Kindy:

Shirley Contracting Company, LLC (Shirley), as the Offeror, and Dewberry Engineers Inc. (Dewberry), as the Lead Designer, are pleased to submit our Team's Technical Proposal for the Route 7 and Battlefield Parkway Interchange Design-Build Project (the Project). Our Team will provide VDOT and the traveling public with an unequalled level of assurance that the Project is completed successfully and exceed the priorities established while limiting risk to all stakeholders.

4.1.1: The Offeror is Shirley Contracting Company, LLC, 8435 Backlick Road, Lorton, Virginia 22079.

4.1.2-4.1.3 - Declarations: Should Shirley be selected, it is our intent to enter into a contract with VDOT for the Project in accordance with the terms of this Request for Proposal (RFP). Further, the offer represented by our Technical and Price Proposals will remain in full force and effect for one hundred twenty (120) days from the date this Technical Proposal is submitted to VDOT.

4.1.4 - Point of Contact: Garry A. Palleschi, Vice President, Shirley Contracting Company, LLC, 8435 Backlick Road, Lorton, VA 22079, P: 703.550.3579, F: 703.550.9346
E: gpalleschi@shirleycontracting.com.

4.1.5 - Principal Officer: Michael E. Post, President/CEO/Manager, Shirley Contracting Company, LLC 8435 Backlick Road, Lorton, VA 22079, P: 703.550.8100.

4.1.6 - Final Completion Date: November 30, 2021

4.1.7 - Unique Milestone Dates: #1 Detour Intersection Improvements - January 15, 2020
#2 Open West Driveway - June 23, 2020
#3 Open Keystone Drive - August 27, 2020.

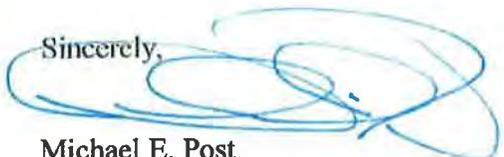
4.1.8 - Proposal Payment Agreement: An executed Proposal Payment Agreement, Attachment 9.3.1, is included in the Appendix.

4.1.9 - Certification Regarding Debarment Forms: Signed Certification Regarding Debarment Forms from all Team members are included as an attachment in the Appendix.

4.1.10 - DBE Participation Goal: Shirley commits that we will achieve a 13% DBE participation goal for the entire value of the contract.

On behalf of the entire Shirley/Dewberry Team, we thank VDOT for the opportunity to submit this Technical Proposal and look forward to your favorable review.

Sincerely,



Michael E. Post
President/CEO/Manager

4.2 Offeror's Qualifications



4.2 Offeror's Qualifications

4.2.1 Confirmation

We confirm that the information contained in our Statement of Qualifications (SOQ) remains true and accurate in accordance with Part 1, Section 11.4, with the exception of Dulles Engineering, Inc., who will be replaced by Dulles Geotechnical and Material Testing Services, Inc., as the Quality Assurance Testing firm. This change was approved by VDOT's Alternative Project Delivery Division on October 9, 2018. In addition, we have replaced Dennis Couture with Bryan Lilly, PLA as the Landscape Designer. This change was approved by VDOT on November 6, 2018.

4.2.2 Organizational Chart

The Project Organizational Chart on the following page identifies the "chain of command" and major functions to be performed and their reporting relationships in managing, designing and constructing the Project, including quality control/quality assurance. The Organizational Chart has been updated to reflect Dulles Geotechnical and Material Testing Services, Inc. as the QA Testing firm, and Bryan Lilly, PLA as the Landscape Designer. Since the SOQ submittal, there has been no change to any functional relationships among the participants, therefore an updated narrative is not required.

4.2.2 ORGANIZATIONAL CHART



THIRD PARTY STAKEHOLDERS

TOWN OF LEESBURG LOUDOUN COUNTY PUBLIC SCHOOLS TRAVELING PUBLIC MEDIA LOCAL BUSINESSES COMMUNITY REPRESENTATIVES LOCAL RESIDENTS VIRGINIA STATE POLICE LEESBURG POLICE DEPARTMENT	EMERGENCY SERVICES LOCAL LOUDOUN COUNTY TRANSIT SERVICES LEEGATE, LLC CARDINAL PARK BUSINESSES MARKETPLACE AT POTOMAC STATION MEADOWS FARMS THIS N THAT AMISH OUTLET CONSIGNMENT SOLUTIONS CHURCHES
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DESIGN-BUILD PROJECT MANAGER
JEFF AUSTIN, PE, DBIA
SHIRLEY

RIGHT-OF-WAY MANAGER
RYAN MARRAH
SHIRLEY +

APPRAISALS/OFFERS NEGOTIATIONS
DIVERSIFIED PROPERTY SERVICES

TITLE REPORTS/ SETTLEMENTS
Old Dominion T/A
KEY TITLE

THIRD PARTY PROPERTY OWNERS

LEAD UTILITY COORDINATOR MANAGER
KEITH GARDNER, ASSOC. DBIA
SHIRLEY

THIRD PARTY UTILITIES

SAFETY MANAGER
JULIE TURNER
SHIRLEY +

QUALITY CONTROL MANAGER
NICK CARSWELL, PE
DEWBERRY

QC TESTING TECHS/ LAB & INSPECTORS
GeoConcepts Engineering, Inc.

CONSTRUCTION MANAGER
ERIC ANDREWS
SHIRLEY

PROJECT MANAGER
KEVIN LYONS
SHIRLEY

STRUCTURAL MANAGER
ZAK KNOLL
SHIRLEY

MOT SUPERVISOR
TERESA FLORES-RODRIQUEZ
SHIRLEY

ENVIRONMENTAL COMPLIANCE COORD.
DJ TURNER-SMITH
SHIRLEY

DESIGN MANAGER
STEVE KUNTZ, PE, DBIA
DEWBERRY

LEAD STRUCTURAL ENGINEER
MARK UNTERKOFER, PE
DEWBERRY +

LEAD HYDRAULIC ENGINEER
PHIL JONES, PE
DEWBERRY

ENVIRONMENTAL PERMITTING/MONITORING
BETH PATRIZZI
DEWBERRY

GEOTECHNICAL
SUSHANT UPADHYAYA, PE
GeoConcepts Engineering, Inc.

AERIAL MAPPING
QUANTUM SPATIAL, INC.

UTILITY DESIGNATION & TEST PITS
SURVEYING AND MAPPING, LLC

LEAD MAINTENANCE OF TRAFFIC ENGINEER
JERRY MRYKALO, PE, PTOE
DEWBERRY +

LEAD ROADWAY ENGINEER
ERIK DULL, PE
DEWBERRY

SIGNING/MARKING/LIGHTING ENGINEER
ROBERT SCHEIDLER, PE
DEWBERRY

LEAD SURVEYOR
JESUS ECHEVARRIA, LS
DEWBERRY

LANDSCAPING
BRYAN LILLY, PLA
DEWBERRY *

QUALITY ASSURANCE MANAGER
AVTAR SINGH, PE, DBIA,CCM, PMP
CES CONSULTING, LLC

QA INSPECTOR
MOSTAFA KALANI
CES CONSULTING, LLC

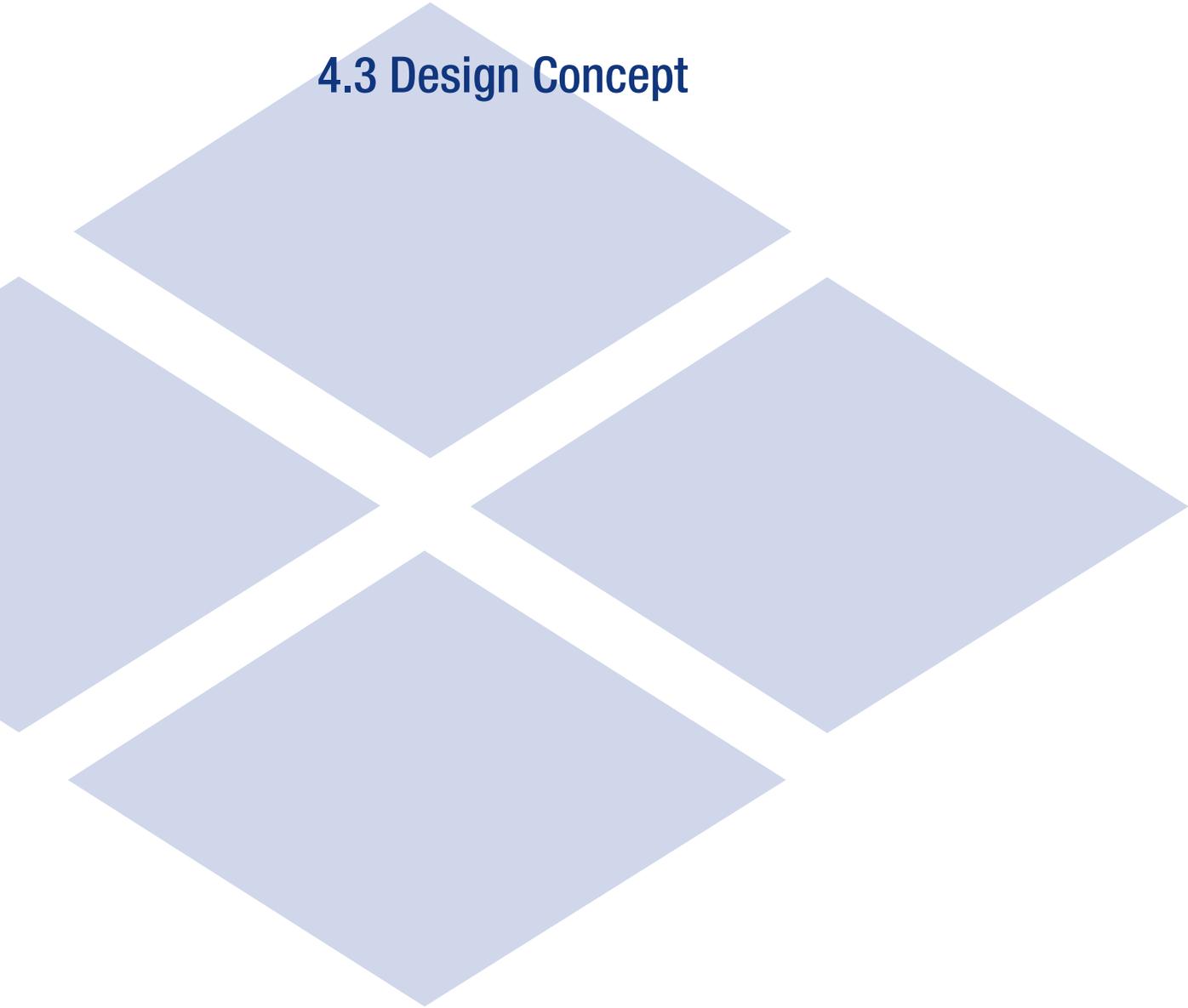
QA TESTING TECHNICIANS/LAB
DULLES GEOTECHNICAL AND
MATERIAL TESTING SERVICES, INC. *

DESIGN QUALITY ASSURANCE
JEREMY BECK, PE
DEWBERRY

LEGEND

- Construction (Blue box)
- Design (Green box)
- Quality Assurance (Orange box)
- Quality Control (Black box)
- Right-of-Way (Grey box)
- 3rd Parties (Red box)
- Key Personnel (Key icon)
- Value Added (+ icon)
- Communication (Dashed line)
- Direct Reporting (Solid line)
- Approved Change from SOQ (* icon)

4.3 Design Concept





4.3 Design Concept

Introduction

The construction of a new interchange at the intersection of Route 7 and Battlefield Parkway represents a unique opportunity for our Team, since the construction of Battlefield Parkway between Kincaid Boulevard and Route 7 was one of the first design-build projects our Team completed for VDOT. At the time we developed and completed that Project, we worked closely with VDOT and incorporated numerous design enhancements to more easily accommodate the future interchange at Route 7. As we initiated our review of the RFP documents, we did so with a thorough understanding of the existing conditions, a working relationship with the adjacent developments, and knowledge of the challenges faced during the original design and construction of Battlefield Parkway. We are cognizant of the significant amount of collaboration and coordination that has already occurred between VDOT, The Town of Leesburg, Loudoun County, and the public that led to the selection of a Single Point Urban Interchange (SPUI) as the best overall solution at this location. After a thorough review of all interchange options, our Team concurs with this configuration.

Our Team's knowledge of the Project area and understanding past decisions and agreements between stakeholders will enable us to start quickly, advance critical elements of design, and ultimately achieve the aggressive schedule which has been committed to the public and Town of Leesburg. Recognizing that the schedule is one of the major Project challenges, our Team investigated several interchange concepts and alternate designs which would improve constructability and allow for different work packages to be initiated outside of the 12 month closure of Battlefield Parkway. Based on feedback from VDOT at our ATC meetings, and acknowledging that implementation of a unique interchange design would require additional public outreach and approvals from third parties which cannot be accounted for in the Project Schedule, our Team focused on optimizing the design of the SPUI to accomplish the following:

- Adjust ramp geometry and Battlefield Parkway lane alignment to reduce right-of-way and easement impacts;
- Reduce vertical grade adjustments at the Russell Branch and Potomac Station Shopping Center intersections to improve safety and operations during construction;
- Optimize stormwater management facilities to reduce right-of-way impacts; and
- Reduce the size of the bridge to simplify and accelerate construction and reduce long-term maintenance.

In addition, our Team's concept:

- Meets or exceeds all requirements listed in the Design Criteria Table;
- Ensures that the limits of construction to include all stormwater management facilities are within the existing/proposed right-of-way limits shown in the RFP Conceptual Plans; and
- Does not include design elements that require Design Exceptions and/or Design Waivers unless they are identified or included in the RFP or Addendum.

During preparation of this Technical Proposal, our Team met on a weekly basis to review the RFP and Addendum requirements, discuss refinements and enhancements which could be implemented, and focus on the critical challenges. Our Team's unique understanding of the Battlefield Parkway area and our successful completion of four other SPUIs within the Northern Virginia District (including the Route 7/659 Interchange which is open to traffic) allowed us to **develop and implement numerous enhancements** which will improve safety

4.3 Design Concept

and operations, foster public acceptance of the interchange, allow for on-time completion, reduce impacts to adjacent properties, and minimize long-term inspection and maintenance needs. These enhancements are shown and labeled on our Volume II – Design Concept Plans and are described in Table 1 below:

Table 1 Design Concepts Enhancements

Location / Design Element	Enhancement	Project Benefit
Battlefield Parkway Lane Alignment	Revised the northbound lane alignment immediately south and north of Russell Branch Parkway	<ul style="list-style-type: none"> Eliminates outside widening and reconstruction of the curb & gutter, bench and Shared Use Path south of Russell Branch Parkway Eliminates the proposed retaining wall south of Russell Branch Parkway Avoids impacts to the emergency access on Parcel 007 Avoids right-of-way and easement acquisition on Parcel 007 Eliminates both Design Waivers associated with the reduced Shared Use Path width and reduced buffer strip width in the southeast corner of the Battlefield Parkway/Russell Branch Parkway intersection Improves safety and operation during construction Reduces initial construction cost Mitigates schedule risk
Battlefield Parkway Profile	Optimized vertical profile over Route 7	<ul style="list-style-type: none"> Reduces overlay within Russell Branch Parkway and Potomac Station Shopping Center intersections, improving safety and operations Avoids reconstruction of pavement, curb & gutter, and adjacent facilities and structures along the northbound Battlefield Parkway lanes south of Russell Branch Parkway intersection Reduces initial construction cost Mitigates schedule risk
Stormwater Management	Optimized stormwater management layout and facility locations	<ul style="list-style-type: none"> Reduces right-of-way impacts Eliminates 36 Manufactured BMPs and 3 SMW facilities Improves hydraulics for Route 7 crossings Improves efficiency for 2 existing BMPs Provides space around BMPs for landscaping Incorporates flowering BMP plantings for enhanced aesthetics Reduces long-term maintenance
Bridge Geometry	Refined Shared Use Path and sidewalk geometry over the bridge	<ul style="list-style-type: none"> Reduces bridge deck area Reduces length of pedestrian crossings, improving pedestrian safety and vehicle operations Improves pedestrian crossing alignments at ramp terminals Reduces long-term maintenance
Ramp and Spur Geometry	Refined ramp and spur geometry to minimize interchange footprint and reduce locations of compound curvature	<ul style="list-style-type: none"> Increases offset from Spur A and Spur D to proposed right-of-way line and transmission towers Reduces the retaining wall area and future maintenance Revised Spur C geometry reduces grading impacts on adjacent property and improves merge geometry with Ramp C Ramp profiles developed to avoid reconstruction when Route 7 is widened to 8-lanes

4.3.1 Conceptual Roadway Plans

(a) General Geometry

Route 7

Upon elimination of the signalized intersection and completion of the interchange at Battlefield Parkway, Route 7 will function as a free-flow facility from Lexington Drive to the Town of Leesburg, and one of the remaining at-

4.3 Design Concept

grade intersection bottlenecks will be eliminated. Since this Project consists of a new overpass of Route 7, only minimal improvements are necessary on Route 7. A 6-lane typical section will be maintained, and widening within Project limits will be completed to provide or maintain three 12' wide travel lanes in each direction. Upon elimination of the signalized intersection and completion of the interchange at Battlefield Parkway, Route 7 will function as a free-flow facility from Lexington Drive to the Town of Leesburg, and one of the remaining at grade intersection bottlenecks will be eliminated. Since this Project consists of a new overpass of Route 7, only minimal improvements are necessary on Route 7. A 6-lane typical section will be maintained, and widening within Project limits will be completed to provide or maintain three 12' wide travel lanes in each direction. Horizontal curves and baselines for both eastbound and westbound Route 7 have been developed to match the existing conditions. Curve data for both baselines is provided on our Volume II – Design Concept plans. Auxiliary lanes will be constructed at each ramp terminal and will extend to the adjacent interchanges, providing continuous 12' wide auxiliary lanes from the Route 15 Bypass Interchange to the River Creek Parkway/Crosstrail Boulevard Interchange. Improvements on Route 7 have been designed to be compliant with Urban Other Principal Arterial (GS-5) criteria and a 60mph design speed. Within the Project limits, full width median shoulders (8' paved and 10' to face of guardrail) will be constructed adjacent to an open median ditch. A minimum 10' median width has been maintained, and is located under the Battlefield Parkway bridge where pier protection will be constructed. On the outsides of Route 7, curb & gutter (CG-7) will be installed between the adjacent interchanges leading up to the ramp terminals, where the curb & gutter will transition outward to provide full width paved shoulders on the interchange ramps. Within the interchange ramp areas, full width outside shoulders (8' paved and 10' to face of guardrail) will be constructed.

The Battlefield Parkway bridge abutments have been located to accommodate a future widening to 8-lanes to the outside, consistent with Attachment 2.2.c of the RFP documents. Additionally, having designed several other SPUI's on roadways where future widening is to be accommodated, we have developed the profiles for each of the interchange ramps such that future widening of Route 7 will **not** require pavement reconstruction within the ramp gore areas. By projecting the future 8-lane travel lane areas, we are able to project gore cross slopes to their ultimate locations and develop profiles which will only require wedge overlay at the ramp approaches. **This design enhancement ensures that the interchange ramps will not need to be reconstructed when Route 7 is widened to 8-lanes in the future, a substantial improvement over the RFP.**

Battlefield Parkway

Battlefield Parkway has been designed to provide a 6-lane median divided facility between Russell Branch Parkway and the entrance to the Potomac Station Shopping Center. Improvements have been designed in accordance with VDOT's Urban Minor Arterial (GS-6) criteria and a design speed of 45mph. At the Russell Branch Parkway intersection, as shown in Figure 4.3.1.1, we have adjusted the horizontal lane alignments to accommodate the 6-lane section, match to the existing 4-lane typical section south of Russell Branch Parkway (which accounts for a future median widening to 6-lanes), and avoid the reconstruction of the curb & gutter, bench, shared use path, and retaining wall in the southeast quadrant.

This modification was done by implementing a horizontal curve transition south of Russell Branch Parkway which reduces the median width but does not preclude the future median widening to 6-lanes.

This represents a significant enhancement and reduction of impacts on Battlefield Parkway, completely eliminating impacts to the Town of Leesburg property south of the intersection.

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Figure 4.3.1.1 – Russell Branch Parkway Intersection 4-Lane and 6-Lane Configuration

Since the existing shared use path does not need to be reconstructed south of Russell Branch Parkway, it also eliminates two (2) design waivers which are identified as part of the RFP documents. For the remainder of Battlefield Parkway, a 10' wide shared use path will be constructed adjacent to the northbound lanes, and a 5' concrete sidewalk will be constructed along the southbound lanes. At the northern end of the Project, the 5' sidewalk will continue past the Potomac Station Shopping Center entrance, terminating at the Potomac Station Drive intersection and connecting to the existing pedestrian facilities. Minimum 4' wide raised medians are provided on Battlefield Parkway and will incorporate architectural treatment as required by the RFP. Where medians are 6' or wider, raised grass (MS-2) medians are incorporated and will include 2" topsoil (minimum) to facilitate future planting and landscaping by others.

Single Point Urban Interchange

At the SPUI, 12' wide dual left turn lanes are provided in each direction, and the receiving and ramp lane widths have been increased as required by Attachment 2.2.b to accommodate the side-by-side operation of a WB-67 on the outside and adjacent to a SU-40. Single lane ramps consist of a 16' travel lane, and dual lane or three-lane ramps consist of 12' lane widths resulting in 24' to 36' ramps. Left shoulders include a minimum 4' wide paved shoulder and a 6' offset to the face of guardrail, and the paved widths increase to 6' (matching the face of guardrail) in locations where curb is necessary. On the outsides of the interchange ramps, minimum 8' wide paved shoulders are provided with a 10' offset to the face of guardrail. Where curb is required on the outside edges of the interchange ramps, it has been aligned with the face of guardrail, and the paved shoulder width has been increased to 10' to extend to the face of curb and guardrail. Transitions between "open shoulders" and curb & gutter sections have been introduced on each of the interchange Spurs to provide a transition from the ramp typical section to the curb & gutter section on Battlefield Parkway.

West Driveway & Keystone Drive

The West Driveway and Keystone Drive alignments are identical to those identified in the RFP documents. Each roadway will consist of 2 – 11' wide travel lanes. The West Driveway includes an 8' graded shoulder on both sides while Keystone Drive incorporates CG-6 on both sides and a 5' concrete sidewalk on the east side of the roadway.

(b) Horizontal Alignments

Horizontal alignments have been developed for Route 7, Battlefield Parkway, and the interchange ramps in an effort to avoid sliver widenings, reduce right-of-way and easement impacts, avoid reconstruction of improvements south of Russell Branch Parkway, and reduce or avoid utility impacts. Curve data for each

4.3 Design Concept

alignment is included in our Volume II – Design Concept Plans and are compliant with the standards and design criteria provided on RFP Attachment 2.2.a and 2.2.b.

Route 7

The alignments of Route 7 are virtually identical with those identified in the RFP documents, with only minor adjustments incorporated in an attempt to better match the existing roadway alignments, crown locations, and avoid sliver widenings to either the median or outside edges of the road.

Battlefield Parkway

The horizontal alignment of Battlefield Parkway has been adjusted to match the original baseline location (per the Battlefield Parkway Project Plan U000-253-110) at the southern limit of the Project so that superelevation transitions and lane configurations, including the future median widening to 6-lanes, are accurately accounted for. This southern end is where our Team adjusted the lane alignments in a manner which eliminates the need for reconstruction of all improvements in the southeast corner of the Russell Branch Parkway intersection. Combined with the vertical profile enhancements implemented by our Team, **we are able to avoid all reconstruction and regrading in the southeast corner. This eliminates the retaining wall and all grading, temporary and permanent easements, and proposed right-of-way in that location.**

Interchange Ramps

Each of the interchange ramps are adjusted to improve geometry and safety and to eliminate compound curves in as many locations as possible. Turning movements ensure a minimum 10' separation between opposing lefts, and Spurs tie into the tangent section of each Ramp, avoiding reversing curves at the beginning of the Spurs. Horizontal curve information is provided in our Volume II – Design Concept Plans and Table 2 below represent the minimum horizontal radii used on each Ramp and Spur:

Table 2 Minimum Horizontal Ramp and Spur Radii

Alignment	Minimum Radius	Alignment	Minimum Radius
Ramp A	225.0'	Spur A	200.0'
Ramp B	300.0'	Spur B	250.0'
Ramp C	225.0'	Spur C	200.0'
Ramp D	400.0'	Spur D	160.0'

On Spur A the horizontal geometry is revised to reduce impacts to the adjacent property and reduce the length and height of the retaining wall adjacent to the Dominion transmission tower. The revised horizontal alignments of Ramp A and Spur A combined provides an additional 11' between the face of the barrier/retaining wall and the Dominion transmission tower.

West Driveway & Keystone Drive

The horizontal alignments for both West Driveway and Keystone Drive are identical to those depicted in the RFP documents due to the restrictions on right-of-way adjustments and in recognition of prior public outreach efforts.

(c) Maximum Grades

Maximum grades for all segments and connectors are identified in Table 3 below. As noted, Route 7 profiles

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will be developed to match the existing roadway profiles, and widening will be completed off of the edge of the existing pavement. The profile of Battlefield Parkway has been optimized to reduce the amount of reconstruction and overlay within the intersections at Russell Branch Parkway and Potomac Station Shopping Center. At the Russell Branch Parkway intersection, overlay has been reduced from a maximum of approximately 18” to a maximum of 9” (isolated at the northern edge of the intersection), avoiding all curb & gutter reconstruction south of the intersection. This reduction also improves safety and mobility during construction, as the need for temporary lane closures and traffic impacts within the existing intersection is reduced. Each of the ramp profiles at the SPUI is based solely on the longitudinal grade and cross slope of Battlefield Parkway, then continues to lower or climb along the ramp to match the elevations/grades on Route 7. Since Battlefield Parkway is in normal section across the bridge, the combination of the 2% cross slope and varying longitudinal grade establishes the vertical profile of the interchange ramps. As the profile of Battlefield Parkway is finalized based on updated surveys and final structural depth calculations, and following finalization of the gore calculations on each ramp at the bridge deck, the final profiles, including those of the spurs will be developed. Spur profiles will be completely dependent on the final ramp profiles and the profile of Battlefield Parkway.

(d) Typical Sections

Typical Sections for each roadway and ramp are included in our Volume II – Design Concept and described below.

Alignment	Maximum Grade
Westbound Route 7	Match Existing
Eastbound Route 7	Match Existing
Battlefield Parkway	7.00%
Ramp A	-6.00%
Spur A	7.00%
Ramp B	5.00%
Spur B	-6.00%
Ramp C	-6.00%
Spur C	-6.00%
Ramp D	6.00%
Spur D	6.00%
West Driveway	10.00%
Keystone Drive	3.42%

Roadway Segments, Shared use paths and Sidewalks

Route 7 consists of a 6-lane typical section (three 12’ lanes in each direction) separated by a varying width depressed median with a minimum 10’ width. Single auxiliary lanes with a minimum width of 12’ are provided at the terminal of each interchange ramp, and the auxiliary lanes extend continuously to the adjacent interchange ramp auxiliary lanes. The outsides of Route 7 vary between open-shoulders (between the interchange ramp terminals) and curb & gutter (beyond the ramp terminals) to match existing conditions. There are no existing or proposed pedestrian facilities on Route 7.

Battlefield Parkway is a 6-lane median divided roadway with raised medians and curb & gutter along the outsides. Single or dual-left turn lanes and single right turn lanes are provided at the intersections, including at the SPUI, consistent with the RFP lane configurations. A 5’ sidewalk is being provided along the entire limits of the southbound lanes, including extending further north to the intersection with Potomac Station Drive, and a 10’ shared use path is provided along the northbound lanes for the entire length of the Project. Immediately south of the Russell Branch Parkway intersection, the existing pedestrian facilities (sidewalk and shared use path) will be retained since our horizontal alignment and vertical profile enhancements avoid the need to reconstruct those facilities.

Interchange ramps consist of either a single 16’ wide lane or between two and three 12’ lanes, depending on the location along the ramp. Spurs are all single lanes, with a minimum width of 18’. Spurs A and C terminate

4.3 Design Concept

in a “yield condition” onto the connecting interchange ramp, while Spurs B and D continue into an auxiliary lane along Battlefield Parkway.

Retaining Walls

In addition to the walls associated with the Battlefield Parkway Bridge over Route 7 (described below), there are two stand-alone retaining walls which are located adjacent to Ramp/Spur D and Ramp/Spur A. These walls are necessary to reduce right-of-way and environmental impacts on the adjacent properties as well as to avoid impacts to the existing Dominion transmission towers.

In the southwest quadrant adjacent to Ramp/Spur D, the retaining wall will be located immediately adjacent to the ramp shoulder, or at the back of the graded bench, and will be an MSE wall with a moment slab and parapet to provide the necessary vehicle protection. This wall is anticipated to be approximately 320' long with a maximum height of approximately 29'.

In the southeast quadrant adjacent to Ramp/Spur A, we have adjusted the location of the retaining wall to be 10' from the proposed right-of-way line and at the bottom of the 3:1 slope which extends down from a point 4' behind the guardrail. The adjusted retaining wall location is possible due to the change in ramp alignment proposed by our Team. By shifting the ramp further to the north, away from the transmission tower, we are able to utilize a standard RW-3 wall, reducing the maximum height from more than 18' per the RFP conceptual design to a maximum of approximately 12'. The length has also been reduced from 580' per the RFP conceptual design to approximately 490'. Since the slope above the wall will be 3:1, this will provide additional area for landscaping adjacent to the road, and a handrail (standard HR-1) will be installed at the top of the wall for the safety of maintenance crews.

Bridge Structure

The Battlefield Parkway Bridge over Route 7 has been designed to accommodate the 6-lane typical section of Battlefield over the bridge and the dual left turning lanes in each direction associated with the SPUI configuration. Underneath, an ultimate 8-lane typical section on Route 7 is accommodated in compliance with Attachment 2.2.c of the RFP documents. Based on our enhanced roadway and pedestrian facility alignments, **we have been able to reduce the bridge deck area by approximately 7,200 sf.** Additional details for the bridge are included in our Volume II – Design Concept plans and additional discussion is contained in Section 4.3.2.

(e) Conceptual Hydraulic and Stormwater Management Design

Storm Drainage

Since the interchange will consist of both open and closed sections, proposed drainage improvements will incorporate both closed system storm drainage elements as well as open section ditch facilities. Battlefield Parkway, the approaching interchange ramps, spurs, and portions of Route 7 beyond the ramp terminals will consist of closed system storm sewers placed in coordination with the curb & gutter. Inlet types will be selected in order to minimize conflicts with proposed guardrail installation. On Route 7 between the ramp terminal areas, open ditches will be used to convey flow off of the roadway and into closed storm drainage systems. Our Team's conceptual drainage design is shown in our Volume II – Design Concept plans and has been refined based on our interchange layout modifications previously discussed, as well as our unique stormwater management approach described in the following sections. Design criteria for the proposed inlets, storm drainage, culverts, and ditches will be based on the requirements of the VDOT Drainage Manual,

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reflecting the classification of roadway, design speed, and typical section.

Our conceptual design layout has been developed to minimize the crossings of Route 7 while also conveying flow to the required stormwater management facilities. Having designed and/or constructed all of the interchanges on Route 7 west of Route 28, we know that the existing crossings of Route 7 are undersized and placed at shallow depths. Accordingly, our drainage concept relies on installation of additional barrels of pipes adjacent to existing facilities which can be retained as part of the final design. These additional barrels of culverts and storm sewers will ensure proper freeboard requirements are met as well as providing the required capacity at each crossing. While the RFP allows pipes to be installed via a range of installation methods, we anticipate that each crossing of Route 7 will need to be installed via open cut methods in phases since adequate cover cannot be provided to facilitate installation via jack & bore methods. See Section 4.5.1 for a further discussion of pipe installation across Route 7, which will be completed in a manner that minimizes public impacts utilizing allowable temporary lane closures.

Finally, we recognize that the RFP identifies several pipes which can be reused as part of the final storm drainage design but that additional inspections are necessary to confirm they are structurally adequate. Immediately following Notice-To-Proceed (NTP), our Team will initiate video inspections of all existing pipes within Project limits to determine their suitability. Pipes which are listed on Attachment 2.7.2 and are found to be in a state of disrepair will be discussed with VDOT to determine the best approach for either rehabilitation or replacement. Adjustments to the proposed drainage design will be made as necessary based on the results of these pipe video inspections.

Hydrologic and Hydraulics Analysis (H&HA)

There are two major crossings associated with the Route 7/Battlefield Interchange Project, both of which cross Route 7. The first is a double 5'x4' box culvert and the second is a single 6'x6' box culvert. Each of these locations will require a Hydrologic and Hydraulic Analysis (H&HA). As part of our Technical Proposal, our Team has already developed preliminary H&HA models for these major crossings. This analysis confirmed the existing crossing do not provided adequate freeboard on Route 7. Our conceptual drainage design addresses the existing sub-standard freeboard conditions at these existing culverts. In order to achieve the required freeboard, additional capacity for each crossing will be provided through the installation of additional pipes.

Stormwater Management

We have developed our stormwater management (SWM) concept in accordance with Virginia Department of Environmental Quality (DEQ) II-B Criteria. As described in the enhancements at the beginning of Section 4.3 and summarized in Figure 4.3.1.2, our Team's concept provides several benefits as compared with the RFP and has been developed to address the following Project requirements:

Water Quality: To address water quality requirements, our design is based on optimizing the existing BMP facilities, implementing additional enhanced BMP facilities, and consolidating the SWM locations to maximize pollutant removal efficiency. It is also based on a complete review and understanding of the stormwater management approach which has been approved for the adjacent Leegate development in the southwest quadrant of the interchange. It was this review of the Leegate plans which



Figure 4.3.1.2 – SWM Enhancements

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identified a unique stormwater management approach. Specifically, upon review of the Leegate development, we recognized that their plans (sheet 81 of the approved site plans) account for treating all runoff from Battlefield Parkway south of Route 7 within a Level 2 wet pond (see Figure 4.3.1.3 for limits of treatment). Therefore, our proposed stormwater concept excludes treatment of this area to ensure both projects remain compliant with stormwater management criteria. If runoff from Battlefield Parkway south of Route 7 were to be treated as part of this Project, the phosphorus removal would be “double counted” and either the Leegate development or the Interchange would be put into a deficit for phosphorus removal. Accordingly, none of this area has been accounted for in our SWM approach for the interchange, **removing the potential conflict between projects and ensuring both the Interchange and Leegate development continue to meet all applicable State and Town of Leesburg requirements.**

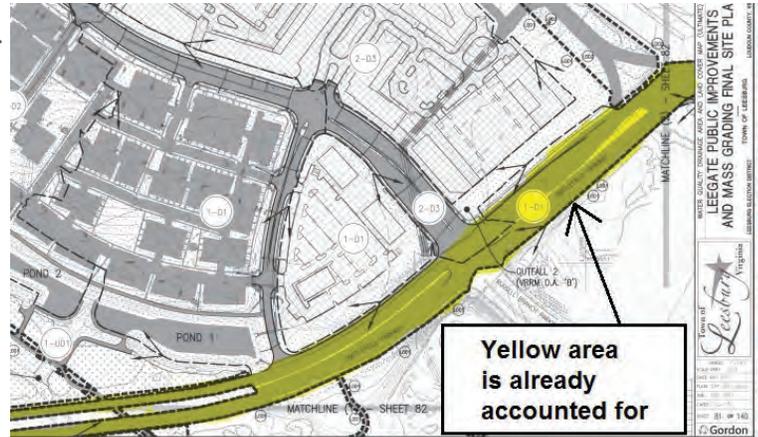


Figure 4.3.1.3 – Battlefield Parkway Accounted for in the Approved Leegate SWM Plan

As shown on our Volume II – Design Concept plans, the result of these enhancements and coordination with the adjacent development plans is that only four BMPs (1 filtering practice, 2 detention facilities, and 1 retrofit BMP) are required to address water quality requirements. The main facility being utilized for stormwater management is the retrofit of the facility in the northeast quadrant, which will be expanded to utilize the entire existing right-of-way in that quadrant. By combining and consolidating our SWM facilities, **we are able to reduce right-of-way impacts by 0.66 acres, eliminate three non-proprietary SWM facilities and eliminate all 36 manufactured BMPs shown in the RFP design concept.** These enhancements not only reduce the initial construction and right-of-way acquisition costs, but also reduces the long-term maintenance costs associated with replacing filter media in the manufactured BMPs. In addition, safety is greatly improved by removing the trees which are typically installed in each of these structures and would be located immediately adjacent to traffic along Battlefield Parkway. The locations of the SWM facilities have also been developed to reduce impacts to wetlands, streams and utilities, both of which will expedite approvals of environmental permits and reduce costs.

Water Quantity: Within the Project limits there are approximately 15 locations where concentrated flow leaves the site which will be analyzed per DEQ II-B criteria. The SWM approach and proposed BMPs described above will be utilized to address erosion and capacity requirements at these outfalls, and will also manage the amount of runoff being directed to the existing off-site BMP facilities.

(f) Proposed Right-of-Way Limits

In accordance with RFP requirements, our Team’s concept is designed to ensure that the proposed improvements are contained within the limits of existing and proposed right-of-way and easements identified in the RFP. Additionally, our Team investigated ways to reduce right-of-way and easement impacts. By adjusting the horizontal alignment of Battlefield Parkway and several of the interchange ramps and spurs, as well as incorporating stormwater management design enhancements, our design concept provides the following right-of-way enhancements and reductions:

- 1.25 Acre reduction of right-of-way (fee simple) acquisition;

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- 2.96 Acre reduction of temporary construction easement acquisition; and
- 0.18 Acre reduction of permanent easement acquisition.

The areas of reduced right-of-way and easement acquisitions are reflected on our Volume II – Design Concept Plans. **The most significant result of our right-of-way enhancements is the complete avoidance of impacts on Parcel 007, owned by the Town of Leesburg.** The elimination of these impacts are a result of our Team’s enhanced horizontal alignment which eliminated the widening of Battlefield Parkway and the reconstruction of the existing retaining wall. In addition to reducing the costs associated with acquisitions, these reductions will reduce environmental impacts, improve permitting timelines, and reduce utility conflicts and relocations.

In the northeast quadrant, we have identified an alternate Limited Access (L/A) Line location which accounts for the stormwater management facility maintenance access and proposed grading. Refinements in the L/A line location will be coordinated with VDOT to ensure the location meets the needs of the Project while being located in an optimal location to preclude access from the adjacent developments. Recognizing that L/A approval will be required by the CTB prior to right-of-way plan approval, we will develop the necessary right-of-way and L/A exhibits at the outset of design, in coordination with VDOT reviews, so that CTB approval is obtained as early as possible.

(g) Proposed Utility Impacts

Based on the schedule for the Project, the avoidance of utility impacts and the ability to relocate unavoidable facilities in an expedited manner is critical for success. Our Team has investigated each of the utilities within the Project limits, identified some utilities which are not reflected in the RFP designation information, and discussed with each of the utility owners ways in which relocations can be avoided. We recognize that the adjacent Leegate development is required to reroute and abandon some of the utilities which would otherwise be in conflict with the interchange improvements. The result of this coordination and in-depth investigations is a thorough relocation plan which is reflected in our Volume II – Concept Design plans. Further discussion of utility avoidance and necessary relocations, and a complete listing of all proposed utility impacts, are described in Section 4.4.2.

(h) Noise Barrier Locations

Consistent with the preliminary noise evaluation and the RFP, we do not anticipate any noise barriers will be warranted or required for the Project. While we have made minor adjustments to lane alignments on Battlefield Parkway and adjusted the vertical profile to minimize the overlays necessary at the Russell Branch Parkway and Potomac Station Shopping Center intersections, neither of these adjustments is expected to impact the results of the noise analysis. Consistent with the RFP requirements, our Team will complete a final noise analysis once final alignments, profiles and grading are developed to confirm whether noise barriers are warranted, feasible and reasonable.

(i) Other Key Project Features

1. Architectural Treatment & Landscaping - Elements such as colored concrete, decorative panels, and stone patterns on walls are key components and will be the most visible elements following completion. We have recent and similar experience with these treatments having implemented similar treatments at the Route 7/River Creek Parkway Interchange shown in Figure 4.3.1.4, Route 7/659 Interchange, and Sycolin Road Overpass Project adjacent to this interchange, and more extensive architectural treatments at the Route 27/244 Interchange. Each of these architectural treatments will require close coordination with the Town of Leesburg

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and VDOT during the design phase to ensure that they can be maintained cost effectively over the long-term. Our Team recognizes that while landscaping is not included in our scope, providing additional landscape areas, flatter slopes (3:1 maximum) and adequate topsoil coverage will ensure future landscaping enhancements can easily be implemented and maintained over the life of the facility.

2. Lighting – Project lighting consists of three major systems: Town of Leesburg street lighting along Battlefield Parkway and Keystone Drive, Town of Leesburg pedestrian lighting along Battlefield Parkway, and VDOT interchange and underbridge lighting. All luminaires will be low maintenance and low operating cost LED fixtures, and pedestrian light poles on Battlefield Parkway will meet Town of Leesburg aesthetic requirements. Interchange lighting will utilize high-mast poles, while underbridge lighting will utilize wall packs installed on vertical bridge elements. Town of Leesburg lighting will be designed to Dominion standards and maintained by Dominion. Interchange and underbridge lighting will be designed to VDOT standards and maintained by VDOT.

3. Off-Site Improvements – Our Team is focused on the challenges associated with implementing a critical road closure with an offsite detour, and the importance of providing both physical and signal timing improvements prior to detour implementation. The planned detour of Battlefield Parkway is nearly identical in scope to the detour our Team successfully implemented within the Town of Leesburg for our Sycolin Road Overpass Design-Build Project. Similar to that Project, off-site improvements will be implemented by our Team prior to the closure of Battlefield Parkway. To achieve this, our Team developed ATC 001, which modifies the intersection of Battlefield Parkway and Fort Evans Road to construct a dual left turn lane from the southbound to the eastbound direction, while maintaining the existing signal pole and mast arm in the southwest quadrant (see Figure 4.3.1.5). A pedestal pole will be installed in the median to provide signal guidance for the newly constructed left turn lane in an effort to not impact utilities or require the acquisition of additional easements for a new signal pole.

At the intersection of River Creek Parkway and Fort Evans Road, modifications will consist of removal of the pavement hatch markings, installation of additional signal heads for the northbound to westbound turning movement, and operation of dual lefts for the northbound to westbound traffic. Furthermore, our Team commits to constructing and **opening these extra lanes and re-optimizing traffic signal timing by January 22, 2020**, prior to the closure of Battlefield Parkway, as an enhancement to provide improvements to traffic flow earlier than required. **This represents our Team's Unique Milestone #1.**

4. Wayfinding Guide Signs – In order to improve driver comprehension and minimize business impacts, our Team commits to installing both temporary (during detour) and permanent wayfinding guide signs directing drivers along modified travel routes. For example, during construction our Team commits to installing M4-V6 business guide



Figure 4.3.1.4 – Architectural Treatment at the Route 7 & River Creek Parkway Interchange Completed by our Team

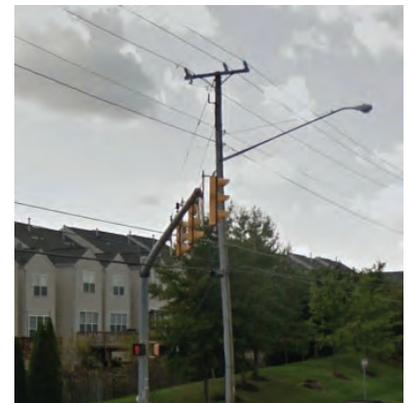


Figure 4.3.1.5 - Replacement of Existing Signal Pole Intertwined with Overhead Utilities is Avoided



Figure 4.3.1.6 - Examples of Wayfinding Signs

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signs to direct motorists to businesses along westbound Route 7 upon closures of the existing driveways, and also installing permanent guide signing to direct motorists to the new access route to Cardinal Park Drive. These signs (pictured conceptually in Figure 4.3.1.6) provide added value to the public and businesses, **exceeding the requirements of the RFP.**

4.3.2 Conceptual Structural Plans

Our Team evaluated multiple interchange configurations and alternatives for the bridge and has determined that a Single Point Urban Interchange (SPUI), as approved by the Town of Leesburg and the public, provides the best solution that will operationally meet the Project’s intended scope. Having recently designed and constructed four SPUI bridges to VDOT standards, our Team is confident that we will deliver a safe, low maintenance, and attractive structure that can be constructed in twelve months. For the SPUI layout, our Team compared a rectangular slab plan, such as we designed at Linton Hall Road over Route 29 in Gainesville, Virginia, which uses prestressed concrete bulb tee beams, instead of the “bow tie” configuration. However, this option proves to be more costly, with excessive deck area, additional pier length, increased construction schedule, and higher long-term maintenance costs. Based on our review of the Geotechnical Engineering Data Report (GDR) provided in the RFP as well as our experience in this area, we examined several foundation types. The abutments are a significant feature of this bridge owing to their length being up to 260 feet. Tall, cast-in-place concrete cantilever abutments on spread foundations were analyzed; however, driven pile supported abutments behind MSE walls were chosen in order to reduce risk associated with achieving adequate bearing and possible rock excavation. In addition, the MSE panels with CRR reinforcing provide a superior quality finish and are low maintenance.

Our Structural Design Concept features innovative enhancements, while meeting all RFP requirements and are described in Table 4 below:

Table 4 Structural Design Enhancements

Location / Design Element	Enhancement	Project Benefit
Bridge Configuration	<ul style="list-style-type: none"> Reduce bridge length by 16’ Reduce bridge width at its narrowest section by 19’ 	<ul style="list-style-type: none"> Reduces deck area by 7,200 SF (18%) Minimizes length of “kicker” beams Reduces total abutment lengths by 71’ Lowers long-term maintenance Reduces initial construction cost Minimizes schedule risk
Superstructure	<ul style="list-style-type: none"> Lightweight concrete Finite Element Analysis to better analyze this complex structure without longitudinal joints 	<ul style="list-style-type: none"> Reduces structural steel quantity and minimizes structure depth Reduces loads to substructure which results in less piling Will accurately model deck pour sequence and reduce construction schedule risk Increases long-term structural integrity
Substructure	<ul style="list-style-type: none"> Driven piles MSE panels w/ CRR at abutments 	<ul style="list-style-type: none"> Reduces risk over spread foundation Reduces long term maintenance Provides high quality precast finish

Superstructure Concept

Our concept reduces the length of the bridge from 200’-4” to 184’-4” (a reduction of 16 feet) while fully accommodating the future widening of Route 7 as depicted on Attachment 2.2.c of the RFP. This length reduction was achieved by moving the abutments closer to Route 7. In addition, our Team reduced the overall width of the bridge from 179’ to 160’ at the minimum width between flared areas. The length and width

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adjustments reduce the bridge deck area by 7,200 SF (an 18% reduction). A comparison of the RFP and our proposed deck plan is shown in Figure 4.3.2.1.

Our concept utilizes Grade 50W weathering steel plate girders. The flared sections of the deck will be supported on “kicker” beams that frame into the main exterior girders. The exterior girders will be painted brown to the limits shown on the RFP bridge plans. Low maintenance, durable elastomeric bearings will be used at the abutments and pier. Lightweight concrete is planned to be used in the deck slab to minimize structure depth and economize on structural steel. The deck slab thickness will be increased where necessary to accommodate the ¼” deep reveal in the patterned crosswalk areas. The deck will be provided with adequate drainage as required. There will be a raised sidewalk on the west side of the deck and a raised Shared use path on the east side. The bridge will be jointless and utilize deck slab extensions with buried approach slabs. VDOT CPSR railings and pedestrian fence will be utilized and will conform to the architectural treatment criteria as shown in Attachment 2.3.10.

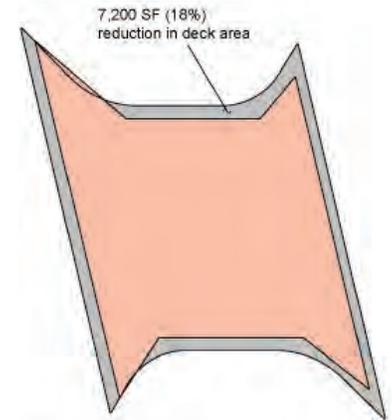


Figure 4.3.2.1 – Reduced Bridge Deck Area

Finite Element Analysis

The RFP requires that no open longitudinal joints are permitted in the deck, even though current VDOT design guidance recommends providing a longitudinal open joint when the bridge width exceeds 100 feet. Given that the minimum bridge width is 160 feet at the pier and over 260 feet along Abutment A, special analysis and design will be required to minimize potential cracking of the deck concrete, determine stresses in cross frames, and provide adequate movement and rotational capacity in the bearings. To mitigate this risk, ensure long-term integrity, and minimize maintenance cost, we have performed a preliminary finite element analysis (FEA) of the bridge deck on the steel “bow-tie” framing as part of our Technical Proposal. Analyses were performed using several different bearing layouts and were examined for stresses due to thermal contraction. Our preliminary analyses indicates that providing bearings that are allowed to translate in the transverse direction at the outside girders and kicker beams will reduce tensile stresses in the concrete deck slab. Figure 4.3.2.2 shows deck stresses (in the transverse direction) based on a standard VDOT bearing layout; with fixed bearings at the pier and expansion bearings at the abutments (free to move longitudinally but fixed transversely). High tensile stresses along the pier and abutments result due to transverse fixity of the traditional bearing layout. Figure 4.3.2.3 models the

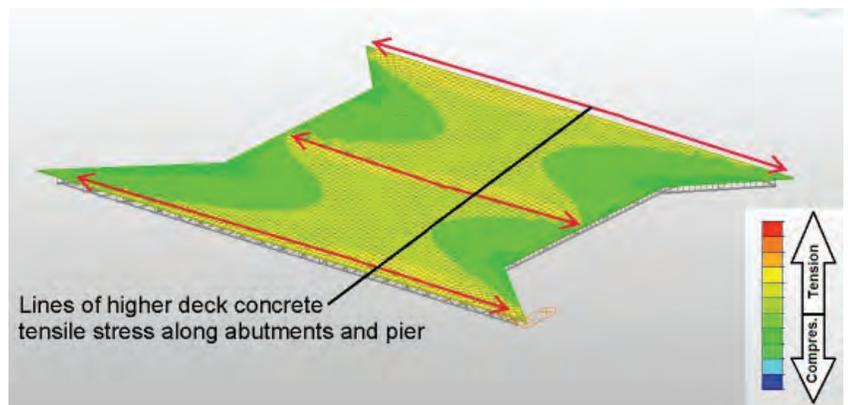


Figure 4.3.2.2 – Deck stresses with standard bearing layout

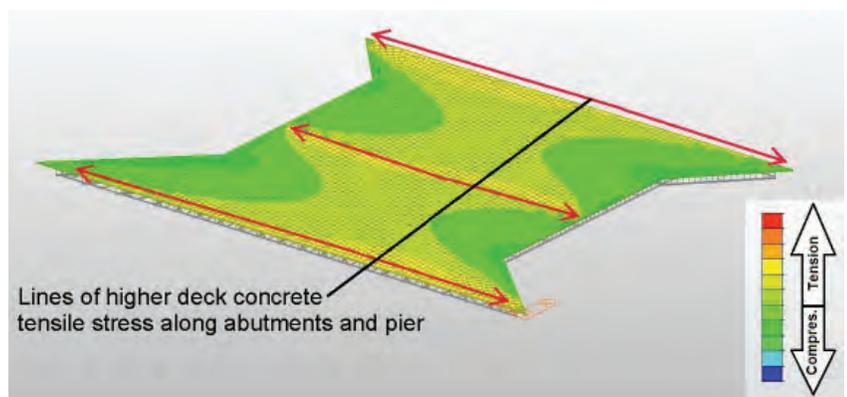


Figure 4.3.2.3 – Deck stresses with some bearings free in transverse direction

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same stress information in which the three exterior bearings at each end of the pier are allowed to translate in the transverse direction. In addition, the three exterior bearings, including the kicker beams at the abutments, are free to translate in all directions. The results show a significant reduction in tensile stress regions.

The analysis results indicate movement demands at the kicker beam bearings of approximately 1 inch. These bearings will require special attention during final design to ensure adequate movement and rotation capacity that will reduce stresses in the structure and therefore provide a safe, durable and low maintenance structure. In addition to our analysis completed to date and **as an enhancement to the contract requirements, our Team will utilize rigorous analysis tools** during final design to determine where additional deck reinforcing may be required to minimize potential cracking, reducing long-term maintenance costs for VDOT.

Substructure Concept

After careful consideration of several abutment designs, including cast-in-place tall abutments on spread foundations, as well as “True” MSE abutments which support the abutments directly on the MSE backfill, our concept utilizes pile supported abutments behind MSE walls. Our preliminary analysis of the geotechnical information provided in the GDR indicates that driven piles into the IGM layer will provide the required capacity and the settlement criteria will be met. This choice is also driven by construction schedule and risk minimization associated with excavation for a spread foundation on variable rock/IGM layers. Our abutment concept includes two rows of piles. Minimum distances between the piles and MSE panels, as well as minimum footing widths, will be provided in accordance with the requirements of Chapter 17 of the VDOT Manual of the Structure and Bridge Division. We anticipate that pile sleeves will be installed around the piles within the limits of the MSE backfill to minimize downdrag load on the piles. Our Team has used this technique on many projects and is fully aware of the design and constructability of this type of foundation. Deck slab extensions will be used to provide a jointless design.

It is anticipated that a multi-column pier on spread foundations will be utilized. Adequate bearing material is within reasonable excavation depths based on our preliminary design and the information provided in the GDR. Abutments and piers will be designed to permit future jacking for replacement of bearings to facilitate long-term maintenance.

Aesthetics

Our bridge will incorporate the architectural treatments as prescribed by the RFP. This will include utilizing the dry stacked stone pattern form liners and color stain coating on both faces of the CPSR railing, and on the exterior face of the abutments and wingwalls. Other architectural treatments include stained concrete on raised buffer areas and shared use path and sidewalk, stamped brick pattern on crosswalks and shared use path and sidewalk, decorative pedestrian fence, lighting and bollards. In addition, non-structural architectural panels will be constructed at each end of the pier that will have lettering to say “Leesburg” and will have the stone pattern and color described in the RFP. Our Team has experience with similar panels that were constructed as part of the River Creek Parkway Bridge over Route 7 and Sycolin Road over Route 7 Bypass Projects.

Retaining Walls

MSE walls will be used in front of the pile supported bridge abutments and will extend parallel to Route 7 to function as wingwalls. **As an enhancement, our Team proposes to provide Class I Corrosion Resistant Reinforcing (CRR) in the MSE panels at the bridge abutments to provide a more durable wall and reduce inspection and maintenance.** Our Team’s optimized realignment of Battlefield Parkway eliminates

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the retaining wall at the southeast quadrant of Battlefield Parkway/Russell Branch Parkway intersection. There are two other stand-alone retaining walls which are located adjacent to Ramp/Spur D and Ramp/Spur A for the purpose of reducing right-of-way and grading impacts on the adjacent properties, and to avoid impacts to the existing Dominion transmission towers. The wall adjacent to Ramp/Spur D has exposed heights up to 29 feet and is anticipated to be MSE type wall with a concrete parapet and moment slab located at the edge of paved shoulder and extending behind the sidewalk along Battlefield Parkway. CRR will be used in the moment slab and barrier. Our Team has optimized the wall adjacent to Ramp/Spur A by locating it near the base of a 3:1 fill slope for the ramp. This will eliminate the need for a moment slab and barrier system and also reduces wall area. The wall has an exposed height of approximately 12 feet and is anticipated to be a cast-in-place concrete wall. The wall will have a VDOT Standard HR-1 handrail with required coatings.

Major Drainage Structures

There are two major drainage structures associated with the Project. One is the downstream extension of the existing 6'x6' box culvert which conveys the tributary of Tuscarora Creek under Route 7 (Str. No. 1012). Repairs for spalls, cracks and honeycombing in addition to silt and vegetation removal from the inlet will be required in the existing structure. VDOT Standard BCE-01 details for extending the existing culvert will be used. The extension will utilize VDOT Standard BCS-20 box culvert details and account for the depth of fill required on Ramp D. There will be a special design headwall at the outfall that will also function as the headwall for an adjacent new 72" pipe culvert.

The second major drainage structure is the downstream extension of an existing double 5'x4' box culvert under Route 7. VDOT Standard BCE-01 details for extending existing culverts will be used. The extension will utilize VDOT Standard BCD-05 standard details. There will be a special design headwall at the outfall that will also function as the headwall for an adjacent triple 42" pipe culvert.

Our Team's optimized realignment of Battlefield Parkway, south of Russell Branch Parkway, **eliminated all potential impacts to and work above the existing box culvert in the southeast quadrant of the intersection, representing a major enhancement to the RFP conceptual design.**

Key Structural Features

As described above and shown in our Volume II - Design Concept Plans, our Team's structural concept meets or exceeds the Project's intended scope and will benefit end users, particularly in terms of safety, operations, schedule, construction, and public acceptance. Key features include:

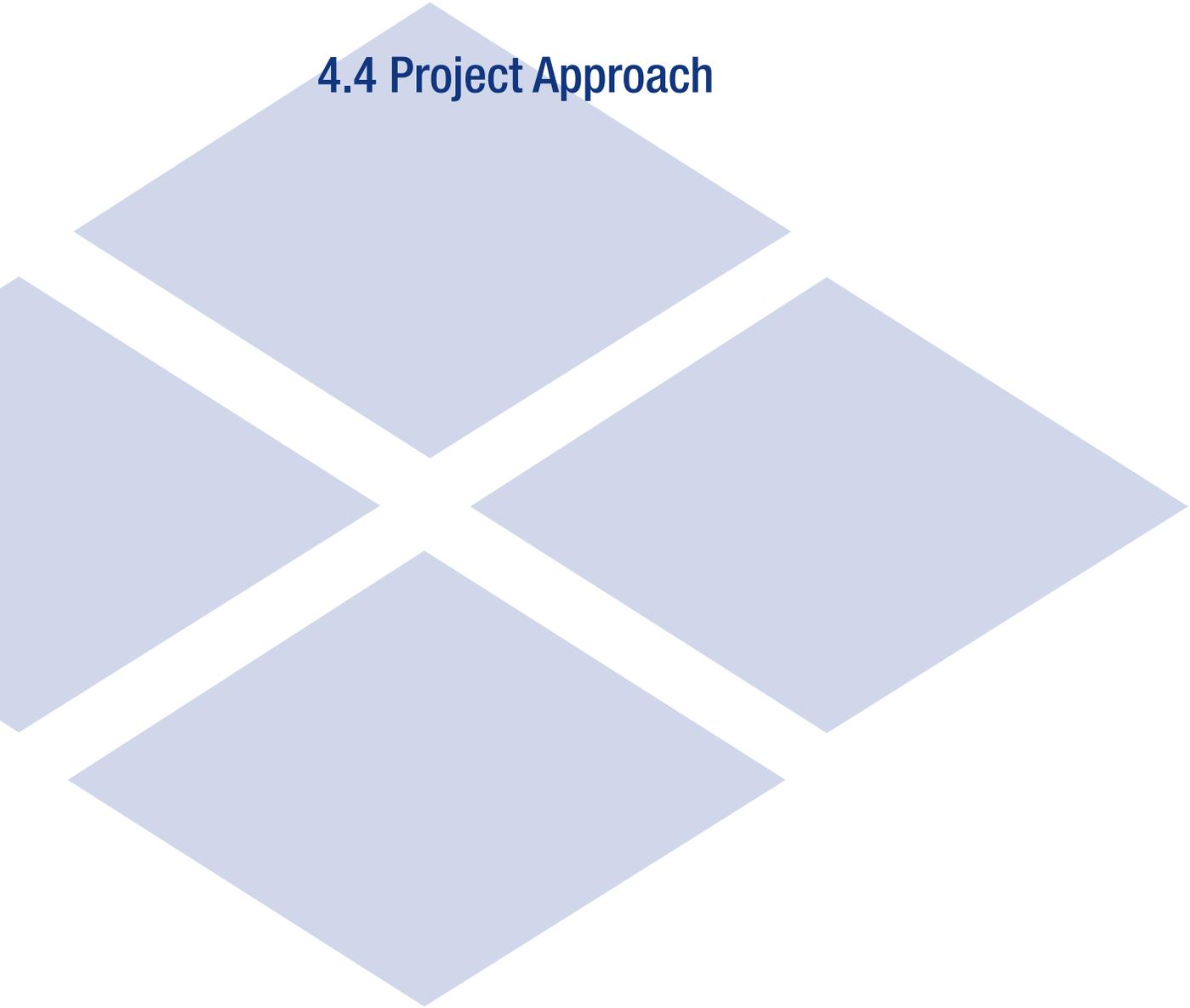
- Safety – Ramp and mainline vertical and horizontal geometry that meet site distance requirements;
- Safety – Bridge Pier Protection at pier and MSE abutment walls;
- Operations – Flared steel framing that supports two-lane ramps at each corner of SPUI; widths of bridge to provide for three (3) through lanes and dual turn lanes on Battlefield Parkway; and locating abutments and pier to provide for three (3) lanes for each direction of Route 7 with provision for future widening;
- Operations – Span lengths that provide for future widening of Route 7;
- Safety, Operations and Public Acceptance – Provision of raised Sidewalk, shared use path, brick patterned crosswalks, colored concrete, decorative lighting and bollards, dry stack stone form liners on concrete portions of railings, and fencing that guide pedestrians that use the bridge;
- Schedule and Construction – Using driven piles at abutments to reduce risk;
- Schedule and Construction – Reduced bridge width/area that reduces construction time. Bridge can be

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constructed in twelve months;

- Schedule and Construction – Use of Finite Element Analysis of complex superstructure to assist in deck pour sequencing and timing to allow for faster, properly designed deck placement;
- Schedule and Construction – Eliminating the retaining wall at the SE quadrant of Battlefield/Russell Branch and associated impacts to the existing box culvert; and
- Public Acceptance – Providing all architectural requirements described in 2.3.10 of Part 2 of the RFP as well as 3:1 maximum graded slopes within the interchange for future landscaping.

4.4 Project Approach



4.4 Project Approach

4.4.1 Environmental Management

Comprehensive Environmental Management during design and through construction is crucial to the success of the Project. In order to execute this approach, constant coordination between the **Environmental Management Team (EMT)**, each discipline lead, and key personnel is paramount. The EMT is a collaboration of experienced environmental professionals from various fields with extensive knowledge of the permitting process and the subtle nuances of each regulatory agency. The EMT has already begun the coordination and communication necessary to incorporate several project benefits described in Section 4.3. These preliminary efforts ensure project constraints and commitments have been identified to assist the entire Design-Build Team and VDOT, by maximizing opportunities to minimize risks through the avoidance of Project impacts. The EMT utilizes a project specific Environmental Risk Management approach to ensure the following is achieved:

- Impacts to environmentally sensitive areas are avoided and minimized;
- All necessary permits are accurately identified at the outset;
- Project constraints and commitments are identified, reflected on plans, and tracked through construction;
- Permitting facilitated through appropriate timeframes and hold points, and identified in the schedule, to account for environmental risk and constraints;
- Permitted impact limits are clearly defined to all parties involved;
- Construction is monitored and completed in accordance with contract, permits, National Environmental Policy Act (NEPA) commitments, and Project design specifications; and
- Limit risks, and maintain Project schedule and certainty.

Environmental Risk Management is achieved by implementing the management concepts identified in Table 5 throughout the Project design and construction phases to ensure comprehensive integration.

Table 5 Environmental Risk Management

Identify	Integrate	Educate	Coordinate	Communicate	Monitor
<ul style="list-style-type: none"> • Identify project constraints, environmental commitments and identification of Recognized Environmental Conditions (RECs) during RFQ/RFP stage • Facilitate avoidance and minimization efforts in environmentally sensitive areas 	<ul style="list-style-type: none"> • Experienced Environmental Management Team (EMT) fully integrated into Design-Build process • Utilize a proactive approach to minimize impacts, create a realistic project schedule and anticipate items that have potential to cause delay 	<ul style="list-style-type: none"> • Education of the Design-Build team, the public, and the contractors conducting the work • Facilitate creative and innovative solutions for performing work in an environmentally responsible manner while assuring constructability, compliance and meeting or exceeding goals 	<ul style="list-style-type: none"> • Early regulatory agency coordination and regular meetings with VDOT regarding project impacts and avoidance opportunities • Hold Point meetings with DB team before work surrounding environmentally sensitive areas begin and provide EMT opportunity to review upcoming field activities to mitigate potential issues 	<ul style="list-style-type: none"> • Ongoing communication across disciplines to ensure environmental compliance • RFPs reviewed by all disciplines when minor plan or field changes are requested to ensure proposed changes will not impact existing permits 	<ul style="list-style-type: none"> • Site visits utilizing the Environmental Constraints Mapping (ECM) paired with GIS software to monitor impacts to and limits to environmentally sensitive areas • Complete all DEQ VWP inspections to document construction progress and timing of impacts for all permitted areas

Environmental Approach During Design

The challenges and constraints of the Project have been analyzed and the following enhancements have been

4.4 Project Approach

implemented to further minimize and avoid environmental impacts and maintain schedule certainty:

- Reconfiguration of stormwater management ponds to avoid and minimize impacts to streams and wetlands;
- Adjusted lane alignments to eliminate retaining walls and reduce right-of-way impacts; and
- Impacts to wetlands and streams from VDOT's RFP concept were reduced by approximately 0.15 AC and 100 LF, respectively.

To fully integrate environmental concerns into the design and minimize the risk of unforeseen environmental impacts and schedule delays, an **Environmental Constraints Map (ECM)** was designed to identify each of the environmentally sensitive Project areas as related to the proposed improvement. The ECM is developed as a Microstation file which can be referenced into the design files to ensure each environmentally sensitive area and constraint can be identified by each design discipline. An example of an ECM is shown in Figure 4.4.1.1. Additionally, the ECM allows for the use of tablet computers in the field to pinpoint the locations of these sensitive areas by all involved parties. Environmental constraint layers reflected in the ECM include:



Figure 4.4.1.1 – Example of ECM currently featuring Virginia Cultural Resource system, FEMA floodplain mapping, and Area of Potential Effect

- NEPA Project Limits;
- Wetlands and Waters of the U.S. (WOUS);
- Cultural and historic resources limits;
- Recognized Environmental Concerns (RECs);
- Limits of Environmental Site Assessments;
- Noise impact areas based on noise studies;
- Right of Way limits; and
- Neighboring wells and drainfields.

As additional field investigations are completed, the ECM is updated and used to continually track the development of plans to ensure all constraints are accounted for and design details are developed in a way which continues minimization and avoidance efforts. This continual coordination ensures that no issues arise that could adversely impact the Project schedule. To accompany the ECM and ensure that permits are submitted at appropriate times, an **Environmental Commitment Tracking Database (ECTD)** is customized for this Project. The ECTD keeps all parties privy to the status of all required permitting and Project commitments, and provides a comprehensive list of Project and permit commitments, including hold points, to ensure that all work is incorporated into the schedule and tracked to avoid schedule delays. In addition to the ECM and ECTD, the following efforts are utilized during design to ensure the minimization of risk and avoidance of impacts to environmental resources:

Bi-Weekly Coordination Meetings – These formal meetings between design, environmental, ROW, utility, and construction staff ensure plans are being developed in a way which accounts for the needs of each discipline and ensures that environmental constraints are being considered and addressed. Technical input and recommendations are offered in order to remain in compliance, avoid future conflicts between design and construction, and identify further avoidance and minimization opportunities while maintaining constructability.

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Over the Shoulder Reviews – These informal meetings occur during daily interaction between the EMT and design engineers to ensure environmental constraints are being accounted for in “real-time”. This eliminates rework during later stages of design and ensures discussions at formal coordination meetings are properly implemented.

Formal Pre-Application Reviews – The EMT reviews occur prior to formal plan submission and environmental permit application submittals to ensure that comments made and coordination efforts completed during the over-the-shoulder review process have been properly addressed and implemented. Draft permits and impact limits are communicated to construction staff at this time to ensure that construction means and methods have been properly considered during design. Table 6 identifies the environmental resources incorporated into our Technical Proposal which need to be carefully accounted for during design and through construction.

Table 6 Coordination and Methods to Limit Risk to Environmental Resources

Environmental Resources	Requirements	Method to Mitigate Potential Delay
Threatened and Endangered Species	<ul style="list-style-type: none"> Coordinate with USFWS, VDGIF & VDCR regarding the identification and impact assessment of state and federal T&E species (as noted in RFP) Project will implement a Time-of-Year Restriction if required Comply with Special Provisions 	<ul style="list-style-type: none"> Use ECM, put on plans and mark in field: LOD & habitat areas to be avoided No impacts to T&E species expected based on distance from work area Early coordination with T&E agencies during permitting No bat inventory required as no structures are to be removed
Noise Impacts	<ul style="list-style-type: none"> Complete final noise analysis Receive approval from VDOT Chief Engineer and FHWA Perform Noise Abatement Design Report if required 	<ul style="list-style-type: none"> Review prior noise model and run preliminary model of concept design to determine compliance Avoid significant changes in horizontal alignment or vertical profiles which would change the results of the Preliminary Noise Analysis Inform public of survey process, results, and timelines
Cultural Resources	<ul style="list-style-type: none"> Remain within study limits noted in the RFP Allow VDHR and consulting parties to review and comment during Project permitting process 	<ul style="list-style-type: none"> Use ECM overlay of cultural resource study limits to avoid need for additional survey Ensure grading & utilities do not encroach outside of study limits
Wetlands/Streams/Water Quality Permitting	<ul style="list-style-type: none"> Confirm wetland delineation completed by VDOT and acquire a Revised Jurisdictional Determination (JD) if required Obtain all Water Quality permits as required Continue to evaluate and document possible avoidance and minimization alternatives Provide mitigation for unavoidable wetland and waters impacts 	<ul style="list-style-type: none"> Begin wetland delineation at NTP Document avoidance/minimization efforts for rapid permit issuance Conduct early coordination during JD to address questions/concerns and facilitate permitting Pre-Application meeting with Regulatory Agencies to expedite permitting

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Environmental Resources	Requirements	Method to Mitigate Potential Delay
Hazardous Materials	<ul style="list-style-type: none"> Conduct Phase II ESA for all right-of-way acquisitions to comply with special provisions Handle all hazardous waste, solid waste, and hazardous materials in compliance with local, state, and federal regulations Complete and distribute comprehensive spill prevention, control, and countermeasure (SPCC) plan 	<ul style="list-style-type: none"> Conduct updated review of state and federal databases Prepare and maintain SPCC with SWPPP Obtain access to Phase II properties early
Wells and Drainfields	<ul style="list-style-type: none"> Collect digital records for all wells and drainfields within and adjacent to the Project area. FOIA any physical records as necessary 	<ul style="list-style-type: none"> Coordinate and acquire all necessary permits with Loudoun County Health Department and Office of Drinking Water regarding any wells and or drainfields potentially impacted by the Project improvements Investigations completed at the time of NTP to minimize schedule delays

Necessary environmental permit applications will be submitted after the pre-application meeting, 60% design, and utility field inspection (UFI) plans have been vetted through bi-weekly coordination meetings. Submission at 60% plans assures constructability and eliminates conflict with construction and utility relocations as well as reduces the potential for delay of permit approvals and any future permit modifications. A final pre-application meeting will be held with all permitting agencies to review Project design and impacts to Wetlands and WOUS. The EMT has found that this approach helps to ensure the submission of a complete application and helps to expedite the permitting process, since each agency can comment on the information presented and provide any recommendations prior to submittal.

Based on preliminary coordination efforts by the EMT, it is anticipated that the Project will require a Department of Environmental Quality (DEQ) General Permit and a United States Army Corps of Engineers (USACE) Individual Permit. EMT review of wetlands and streams, based on the VDOT RFP concept, suggests our proposed design reduces the impacts to jurisdictional areas by approximately 0.15 acres of wetlands and 100 LF of stream.

Environmental Approach During Construction

Environmental Management does not end upon acquisition of the required environmental permits and design approval. Environmental Management is a start-to-finish style approach that continues throughout the life of the Project. The Environmental Management Team will coordinate closely with the permitting agencies to ensure permit requirements are met, construction monitoring is completed efficiently and effectively, and all documentation is up-to-date. The following approach has been designed by experienced staff, with involvement from all possible permitting agencies to ensure environmental compliance is maintained at all times.

Pre-Construction Coordination – Prior to any construction activities, the EMT will return to the field and re-flag all wetlands and waters to ensure limits are identified by construction staff and can be properly protected with silt fence and orange safety fence to ensure avoidance of impacts to non-permitted areas. Permit impact plates, approved during the permit application process, detailing the temporary and permanent impact limits,

4.4 Project Approach

will be shared with construction staff to ensure avoidance of non-permitted areas. **The areas where orange safety fence is required will be highlighted and coordinates will be provided so the limits can be surveyed.** Additionally, a pre-construction environmental constraints and commitments meeting will be held to educate all parties on the allowable limits of work specific to the Project.

Bi-Monthly Construction Visits – Due to the importance placed on environmental protection, our Team will exceed permit requirements by completing bi-monthly environmental site visits instead of monthly monitoring visits. These site visits ensure permit requirements are met, erosion control measures are properly installed and maintained, and areas that may require additional attention are identified before becoming a deficiency on a formal log or C-107 review.

These site visits will utilize the ECM, on tablets, to ensure permit compliance. While in the field, the ECM paired with GIS software, Google Earth, and KMZ files will be used to monitor impacts to wetlands and WOUS in real time. Any potential deviations from the permitted impacts will be assessed and a corrective action plan can be issued in the field. Figure 4.4.1.2 provides an example.



Figure 4.4.1.2 – Example of KMZ detailing impact areas, by number, to be utilized in Bi-Weekly Construction Visits and VWP Permit Compliance

Additionally, these site visits provide the opportunity to evaluate upcoming field activities and have proven effective in mitigating potential issues before they arise. This aggressive approach to environmental compliance provides additional assurances to agency staff that all permit requirements are met.

C-107 Compliance Checks – Completed on a twice-weekly basis, these field inspections are completed by QA, QC, and construction staff to identify deficiencies in erosion control measures and areas where additional attention is necessary. These C-107 reviews will be combined with the bi-weekly construction visits as necessary so that specific details related to environmental requirements can be discussed directly with environmental staff involved in the initial permitting process.

On-Call Assistance – Inevitably, during construction, conditions will arise that require immediate attention. The EMT will be available during construction to meet on-site to address concerns and RFI's. EMT staff with prior knowledge of the Project design will be utilized to provide feedback that properly accounts for commitments and restrictions, previously identified during design. Should field conditions occur that necessitate additional impacts, the EMT will work with regulatory agencies to quickly expedite necessary permit modifications.

Regular VWP Permit Reporting – To assure permit compliance, the EMT will complete the monthly VWP Permit Inspection Checklist and Biannual Construction Status Update Forms to document construction progress and timing of impacts for all permitted areas. As needed, the EMT have the ability to provide additional site visits to ensure permit compliance throughout the duration of the Project. All necessary reports will be submitted to each permitting agency, VDOT, QA/QC, and construction staff.

Compliance Reporting – As required by the permits, in the event that an undesired discharge or impact occurs during construction, the EMT will contact the VDOT Project Manager and provide timely reporting to all necessary agencies. Contact with these agencies will be completed efficiently and effectively, identifying

and implementing appropriate corrective measures quickly in the field.

4.4.2 Utilities

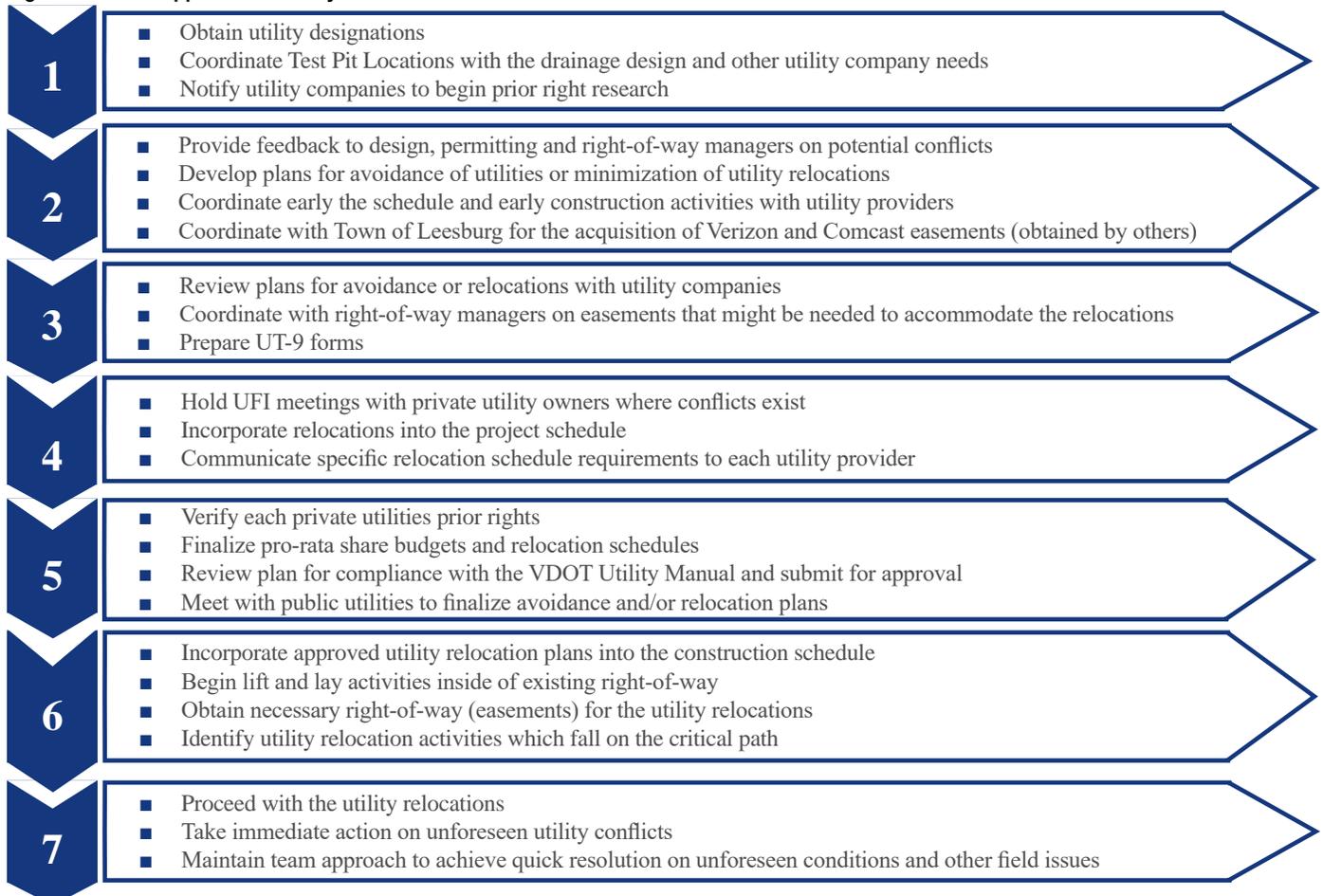
Approach To Utility Coordination, Adjustments, and Relocations

Our approach to successful utility management encompasses the following goals:

- Accurate and timely identification of existing utilities;
- Integration with design to determine conflicts;
- Coordination with utility providers to develop conflict resolution strategies;
- Accurate identification of necessary easements;
- Complete integration with Project schedule and sequence of work; and
- Constant monitoring and tracking of progress.

Our Team began early coordination during the RFP phase with each utility company present throughout the corridor. This will continue in earnest starting early in the design phase, and throughout all Project phases. It is important that the utility companies understand the right-of-way coordination, schedule, sequence of work, and design. Having the utility companies involved early will enable our Team to coordinate their crew availability, anticipated production, and areas of concern into our schedule and design. Once the Project is underway, Figure 4.4.2.1 outlines our approach to utility coordination and the steps and activities we will perform to continue coordination with each utility owner:

Figure 4.4.2.1 - Approach to Utility Coordination



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Team Experience

Our Team has successfully managed utility relocations on VDOT design-build projects for over 16 years, including several projects throughout the Route 7 and Battlefield Parkway corridors. Our Team coordinated utility relocations on the Battlefield Parkway, Route 7/River Creek Parkway, Sycolin Road Overpass, and Route 7/Ashburn Village Boulevard Interchange Design-Build Projects. Those projects required coordination with many of the same utility companies that are present on this Project including Dominion Energy, Verizon, Washington Gas, Summit IG, and CenturyLink. The experience and relationships developed working with each utility owner that is present within Project limits has already benefited us during our early coordination. Our Team utilizes our experience to ensure our relocation concepts meet VDOT and the utility company's standards, and develops accurate relocation durations to include in our schedule.

Specific Utility Impacts

At this stage, our Team has identified multiple conflicts with the proposed interchange. Table 7 provides a summary of the known utilities and their potential conflicts:

Table 7 Utility Impacts and Potential Solutions

Utility Description	Location	Potential Conflict	Relocation Plan
P O W E R			
Dominion Energy Three Phase Overhead	2020+00 to 2050+00	Conflict with proposed widening	Relocate in-kind out of proposed widening
Dominion Energy Three Phase Underground	2027+00 to 2029+00	Conflict with proposed widening	Relocate in-kind out of proposed widening
Dominion Energy Three Phase Overhead	2059+00	Conflict with proposed widening	Relocate in-kind out of proposed widening
Dominion Energy Three Phase Underground	Potomac Station	Conflict with proposed entrance	Relocate in-kind out of proposed entrance
C O M M U N I C A T I O N			
Verizon Underground Copper	2027+00 to 2029+00	Conflict with proposed widening	Relocate in-kind out of proposed widening
Verizon Underground Copper	Potomac Station	Conflict with proposed entrance	Relocate in-kind out of proposed entrance
Verizon Overhead	2020+00 to 2050+00	Conflict with widening attached to Dominion Energy poles	Reattached to Dominion Poles
Verizon Overhead	2050+00 to 2080+00	Conflict with widening attached to Dominion Energy poles	Relocate to duct bank previously constructed by others
Summit IG 14-Way Duct Bank	2023+00 to 2080+00	Conflict with storm sewer and bridge	Lift and Lay out of conflict
Comcast Underground Coax	2027+00 to 2029+00	Conflict with proposed widening	Relocate in-kind out of proposed widening
Comcast Overhead Coax	2020+00 to 2050+00	Conflict with widening attached to Dominion Energy poles	Reattached to Dominion Poles
Comcast Overhead	2050+00 to 2080+00	Conflict with widening attached to Dominion Energy poles	Relocate to duct bank previously constructed by others
CenturyLink Fiber	2051+00	Conflict with bridge footer	Adjust out of conflict and support during construction
CenturyLink Fiber	2020+00 to 2050+00	Conflict with noise barrier and widening	Adjust out of place

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Utility Description	Location	Potential Conflict	Relocation Plan
WATER			
Town of Leesburg 8" Water	2021+00 to 2028+00	Conflict with proposed widening	Relocate in-kind out of proposed widening
Town of Leesburg 16" Water	Potomac Station	Conflict with proposed entrance	Relocate in-kind out of proposed entrance
SEWER			
Town of Leesburg 12" Gravity	2045+00, 5035+00	Conflict with fill	Relocate in-kind with MH's outside of Limited Access
GAS			
Washington Gas 6" Steel	2033+00, 2046+00, 2053+00	Conflict with storm sewer	In-kind offset to eliminate conflict with storm sewer

Schedule Integration, Mitigation of Unexpected Conflicts and Delays

To manage the risk of utility conflicts impacting the schedule, our approach fully integrates this discipline into the design, right-of-way, permitting, construction and scheduling activities. During construction, the Utility Manger constantly monitors progress of the relocations to quickly identify schedule concerns. If encountered, the schedule is reviewed for re-sequencing activities and the utility is tasked with measures to mitigate the delay impact.

During the RFP phase, our Team began to coordinate with each discipline to develop phasing for each utility relocation. This advanced schedule coordination has been developed through multiple discussions with each utility owner, and historical data developed from our past experience with each owner on multiple design-build projects. Using that experience, and information we have received from our coordination with the utility companies we developed the phasing as detailed in Section 4.6 Proposal Schedule.

Encountering unexpected utilities is a risk that can cause many challenges, including added cost to the Project and potential delay to the schedule. The following are strategies our Team has utilized on past projects that successfully limited these risks:

Redesign of Project Features: Once an unknown utility is identified, we will immediately perform an as-built survey of its location and overlay with the design to determine the extent of the conflict. Options will then be review with affected disciplines to redesign elements that minimize and/or avoid the conflicts. If redesign is feasible, the Design Team will issue a formal plan revision to the Team.

Early Coordination: Our Team has already begun early coordination with each utility owner, obtaining as-built drawings and GIS mapping to ensure the utility designations are complete and accurate. This coordination and review and of the existing facilities limits the risk of discovering an unidentified utility during construction. During the RFP phase, we have already identified a CenturyLink fiber line along the eastbound lanes that is not shown on the plans. Identifying this line early will allow our Team to properly incorporate any relocations into our schedule.

Adjust in Place: If an unidentified utility is discovered during construction our Team has successfully raised, lowered, or performed a lift and lay to eliminate the conflict. Adjusting the utility in place to eliminate the conflict without the need for a complete relocation limits the impact to the Project and the utility.

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Assisting in Construction of the Relocation: Another method to handle unidentified utility conflicts our Team has used on previous projects is assisting the utility companies with the utility relocation. We have assisted in the construction of duct banks, performed directional drilling, and drilled poles to assist with relocations. Assisting with the relocation allows our Team to control the schedule portion of the relocation, reducing the risk of delay.

There are several utilities present within Project limits that could have an impact on the schedule, including Dominion Energy Transmission, Dominion Energy Distribution, CenturyLink, and Summit IG. Each of these companies have facilities that will be critical to relocate early in the Project to minimize potential impacts to the Project schedule once Battlefield Parkway is shut down. Our approach to each is as follows:

Summit IG: The 14-way duct bank along the westbound lanes will be in conflict with the ramp construction, storm sewer, and bridge construction. Any complete relocation of this system can be time consuming, due to their system having multiple carriers. Each carrier would have to schedule to pull their fiber and splice independently, which can risk delay to the relocation. During our coordination with Summit IG, we were able to identify areas where they would be able to lift and lay this system out of conflict, so pulling and splicing new fiber would not be needed. This will speed up the relocation, and reduce the risk of delay.

Dominion Energy Distribution: The 3-phase overhead line along the eastbound lanes from Cardinal Park Drive to Battlefield Parkway is in conflict with the proposed widening and Ramp D. The widening of Route 7 and construction of the ramp will be completed early in the Project, prior to Battlefield Parkway being shut down, so this conflict must be resolved early in the schedule. During the design we will prepare a conceptual relocation and easement layout to assist Dominion with design. Advancing the design will expedite adding the Dominion easement to the plans, advancing our right-of-way plans. We will divide the Project into separate Work Orders, allowing us to release Dominion's relocation to construction quickly.

Dominion Energy Transmission: During our early coordination, we were able to coordinate with Dominion Energy Transmission to confirm that there is no physical conflict with the transmission facilities. Although there are no physical conflicts, Dominion Energy can still have an impact on the Project. Dominion will require their easement to remain traversable for future maintenance, so we ensured our design maintains their future access. There are requirements for placing overhead distribution power inside the transmission easement. We have coordinated with Dominion Distribution and Dominion Transmission to confirm that our proposed relocation will meet their requirements.

CenturyLink: CenturyLink's fiber runs along the eastbound lanes of Route 7, and is not shown on the RFP plans. We identified this line during our early coordination, and utilized as-built records to identify its location and potential conflicts. This fiber serves the FAA, Mt. Weather, and FEMA, so any relocation that would require splicing would take extensive coordination. We have been able to identify several areas where our storm would be in conflict with the fiber, but similar to Summit IG, we will lift and lay as much as possible to avoid splicing their fiber, limiting impacts to the Project and to CenturyLink's system.

4.4.3 Geotechnical

We have developed a detailed understanding of the soil conditions anticipated within the Project limits by reviewing the available Geotechnical Data Report (GDR), historical aerials, topographic maps, soil survey maps, USGS geologic maps, and our adjacent Project data. The geotechnical information from the Battlefield Parkway Extension (Kincaid Boulevard to Route 7) Design-Build Project that our Team completed in 2007 was

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highly relevant. Based upon our review, the Battlefield Parkway site lies within the Culpeper Triassic Basin, a fault bordered basin, or graben, that formed as the result of continental rifting during the Mesozoic Geologic Era. The resulting bedrock geology of the Culpeper basin typically consists of coarse-grained sedimentary rocks along the basin margins, with fine-grained sedimentary rock in the interior. During sedimentation of the basin, periodic localized igneous intrusions of diabase granite and basalt occurred, and diabase rock was observed at the subject site area. Residual soils overlying diabase include highly plastic clay and is locally termed as “blackjack”. About 25% percent of the borings drilled within the project limits show this highly plastic clay.

We will ensure that the subsurface exploration is completed at the spacing and locations as specified in the most recent VDOT Materials *Manual of Instructions* (MOI) taking into consideration all previous subsurface explorations performed within the Project area. The top of bedrock can be highly variable and diabase boulders may be encountered in the subsurface, and as such, in addition to the conventional test borings, we plan to perform seismic refraction (geophysical testing) to determine the top of bedrock, hardness of rock or degree of consolidation of sediments, and/or rippability.

We will mitigate geotechnical field investigation risks before starting the field investigation by conducting site visits after borehole locations have been staked, verifying the need for environmental permits, and evaluating offset borehole locations where necessary. Challenging field conditions will be overcome through communication among Team members so that important decisions are made efficiently and result in the smooth progression of the field investigation without compromising the accuracy and quality of subsurface information, which is crucial for the technical integrity of the Project.

The sequence of the subsurface exploration will progress such that the test borings relevant for the design of the bridges, retaining walls, and slopes will be prioritized, followed by the roadway and culvert test borings. To this end, critical information will be shared with the entire Team in a timely manner, allowing the whole of the design team to proceed effectively and to meet aggressive deadlines. We will have an intensive soil laboratory testing program including consolidation, triaxial, and direct shear testing to determine the compressibility and shear strength characteristics of the underlying soils. In addition, unconfined compressive strength testing will be performed on the rock samples.

Geotechnical Considerations

Consistent with all of our design-build projects, we recognize that a thorough evaluation of the existing geotechnical conditions is critical to establishing a comprehensive exploration plan to ensure existing critical features and elements are properly addressed during design and construction. Within the limits of the Project, the most critical elements which need to be considered include:

1. Existing drainage structures which will be subject to placement of additional fill;
2. Existing drainage structures which will be extended, potentially introducing differential settlement at the interface between the existing facility and the new extension; and
3. Existing slopes which will be extended or increased through the placement of additional fill

Our geotechnical exploration plan will consider these challenges by completing the following:

- 1. Existing Drainage Structures** – There are three major culverts within Project limits – two crossing Route 7 and one crossing Battlefield Parkway. These culverts, and the proposed adjustments at each

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structure, are described in Table 8:

Table 8 Summary of Drainage Structure

Alignment	Approx. Station Location	Type of Facility	Approx. Invert Elevation (ft)	Approx. Existing Ground Surface Elevation (ft)	Existing Cover over the Drainage Structure (ft)	Approx. Proposed Roadway Elevation (ft)	Approx. Additional Fill Placement (ft)	Subgrade Material	Estimated Settlement (inch)
Route 7	1034+00	4'x5' Box Culvert	264	274	5	274	0 (Mill and Overlay)	Existing Fill	N/A
Route 7	1046+50	6'x6' Box Culvert	258	271	7	271	0 (Mill and Overlay)	IGM	N/A
Battlefield Parkway	15+50	5.5'x6.5' Triple Box Culvert	243	263	20	263	0 (Minimal fill within existing median)	Boring Terminated in Existing Fill (LEAN CLAY)	N/A

As identified above, both of the existing culverts under Route 7 will not be subject to any additional loading as a result of the Project since areas of new fill placement will occur within the limits of new culvert extensions. At the triple box culvert under Battlefield Parkway, the design enhancement described in Section 4.3.1 to adjust the horizontal alignment south of Russell Branch Parkway eliminates all widening and additional fill placement over the existing structure. In addition to avoiding placement of new fill over the existing triple box, our design enhancement has eliminated the need for construction of a retaining wall over the existing box.

- 2. Differential Settlement** - Settlement analysis was performed to evaluate the estimated total settlement, and most importantly differential settlement along the length of the culverts. Because the amount of fill required over existing culverts has been minimized (located within the median of Route 7) or eliminated altogether (Battlefield Parkway triple box), we do not anticipate any concerns with respect to settlement. Differential settlement has also been investigated at each culvert location and is not expected to be of concern. The only drainage structure which could be subject to differential settlement is the single 6'x6' box at Route 7 Sta. 1046+50. However, this box and the extensions beneath Ramp C and Ramp D is expected to be founded on rock and therefore will not be subject to differential settlement forces at the interface with the existing structure. During final design we will perform in-situ testing (DMT) to evaluate the subsurface profile and strength parameters of the subsurface soils. This will provide more reliable estimated settlement and identify possible remediation options, if necessary.
- 3. Maintaining Existing Slopes** – The maximum height of existing fill slopes within Project limits is approximately 10', which does not raise concerns from a geotechnical perspective. However, existing slopes will be incorporated into proposed fill areas to support the ramp approach embankments to Battlefield Parkway and elevate Battlefield Parkway over Route 7. With the placement of up to 35' of additional fill on or adjacent to the existing slopes, consideration must be given to the shear strength properties of the existing fill material as it could introduce slope and/or global stability concerns. To address these concerns, field investigation measures including in-situ testing (dilatometer testing) will be completed to evaluate the subsurface profile and strength parameters of the subsurface soils. We will perform lab testing such as direct shear and triaxial testing to evaluate the drained and undrained shear strength parameters. We will perform both short-term and long-term slope or global stability

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analysis to ensure the required factor of safety is achieved under both short and long-term conditions. In addition, we will also perform a reliability assessment to ensure that the probability of failure is less than 1, in accordance with RFP requirements.

In addition to the considerations given to existing structures discussed above, we have also considered the following new elements which are proposed as part of the Project:

- 1. Proposed Ramp Embankment Settlement** – A few of the test borings already completed along the ramps show highly plastic FAT CLAY (CH) in the top 3 to 5 feet, underlain by IGM. Since soil stiffness lab results were not provided, we have used empirical correlations to estimate these properties. The initial settlement estimate shows up to 3 inches of settlement along the interchange ramps. However, it is estimated that the settlement will dissipate within 3 to 4 weeks after the fill is placed. We do not believe ground stabilization will be required; however, subgrades will be proof rolled before fill placement and any soft soils will be removed to a depth of 3 feet and replaced with suitable material before placement of embankment fills. In addition, settlement plates will be installed in the deep fill areas to monitor settlement during construction, and final surface paving will not occur until settlement is within acceptable limits.
- 2. Proposed Retaining Walls** – We have completed multiple slope stability analyses of the proposed slopes and global stability analyses for the proposed mechanically stabilized earth (MSE) wall and RW-3 wall adjacent to Ramp D and Ramp A, respectively. No geotechnical concerns are anticipated at the RW-3 wall, although detailed analysis will be completed to ensure there are no adverse impacts to the existing transmission tower foundation as a result of construction of the retaining wall. The adjustment to the Ramp A alignment proposed by our Team provides an increased offset to this transmission tower, which will reduce concerns associated with loading adjacent to the existing tower foundation. The MSE wall along the interchange are considered critical due to their height, and due to their support of the bridge at the abutments. Accordingly, the slopes adjacent to these walls must be greater than 1.5. Preliminary analysis of the subsurface material in the areas of the MSE walls indicates that longer MSE strap lengths, between 0.8 and 1.0 times the height of the wall, will be necessary to provide the proper factors of safety. Having completed the necessary preliminary analysis, our Team has already accounted for these longer strap lengths, and the final lengths will be confirmed following completion of the full geotechnical exploration and testing program.
- 3. Battlefield Parkway Bridge** – Borings already completed at the bridge abutments indicate that the intermediate geomaterial (IGM) was encountered at about 7 to 15 feet below the existing ground surface, and bedrock was encountered at about 10 to 30 feet below the existing ground surface. The top of bedrock dips towards the west and there is about 5 feet of elevation difference from east to west. Because the depth to the top of bedrock is highly variable, we will complete additional borings along the limits of the abutments to develop a more detailed profile of existing rock elevations, helping to develop more accurate pile tip elevations prior to construction. Monitoring the stresses during pile driving will be critical to ensure that no damage is caused to the piles, and a pile driving analyzer (PDA) will be performed on test piles. In addition, PDA test will also be performed on 10 percent of production piles.

4.4.4 Quality Assurance / Quality Control (QA/QC)

Our Team will deliver a superior quality Project that minimizes VDOT's effort and resource requirements by providing detailed, comprehensive, accurate and auditable QA/QC documentation that clearly demonstrates compliance with the contract and standards. Over the past 16 years we have continuously refined our quality

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management approach establishing a quality culture that ensures each work package is governed by well planned quality assessment procedures that generate detailed auditable documentation of quality outcomes. With each Design-Build Project our plan is refined and updated to include changes to VDOT's manuals, special provisions, standards and unique elements specific to each project.

This document serves as the basis for our Route 7 and Battlefield Parkway Interchange Project QA/QC plan. Our QA/QC Plan addresses both design and construction and defines the organization, work processes, and systems necessary to provide assurance and evidence that the Project is another quality undertaking successfully delivered by our Team. Our QA/QC Plan is in accordance with VDOT's Minimum Requirements for Quality Assurance and Quality Control on Design Build and Public- Private Transportation Act Projects, July 2018 (VDOT's QA/QC Manual) and establishes criteria for quality control, quality assurance, owners independent assurance, verification and oversight duties for all personnel.

Design QA/QC Approach

Our approach to design QA/QC includes implementing multiple processes with various QA/QC personnel throughout the duration of the Project. This ensures that appropriate quality standards are included in the plans and other design documents, suitable materials are selected, and work is constructed in a safe manner. Our design QA/QC process is well-structured, easily audited and is continually maintained to minimize VDOT's efforts.

Our Team implements design QA/QC by adhering to the approved QA/QC Plan, conducting design reviews, completing interdisciplinary coordination, performing constructability reviews, involving VDOT in the overall design review process, and ensuring that all field changes follow the same process as original design. A brief discussion of these activities is provided below.

Design QA/QC Plan

As the Design Manager, Steve Kuntz, PE implements and manages the overall design QA/QC program (a subset of our QA/QC Plan) which identifies design quality assurance and quality control requirements. The design QA/QC program establishes the following:

- Procedures for preparing and checking all drawings, specifications, and other design submittals including procedures to correct errors and deficiencies prior to submission;
- Processes to ensure design submittals are stamped, signed, and dated by the responsible Professional Engineer licensed by the Commonwealth of Virginia;
- Actions to ensure that the level, frequency, and methods for review of design, including independent review are in compliance with VDOT's functional requirements for the Project;
- Procedures for coordinating work performed by different persons in the same or different area, fabrication shops, casting yards, and other pertinent fabrication facilities at remote locations, or in related tasks to ensure that conflicts, omission, or misalignments do not occur;
- Procedures for identifying elements of design that require special construction QA/QC attention or emphasis;
- Identification by firm, discipline, name, qualification, duty, responsibility, and authority for all personnel and/or entities responsible for design QA/QC, including sub-consultants; and
- Establishment of design QA/QC functions, including scheduled activities for design QA/QC, identifying the drawings, specifications, and other design submittals that will be submitted to VDOT.

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The Design Manager verifies conformance with the QA/QC Plan using informal observations and by conducting audits of the checking and review processes established within the QA/QC Plan. Documents identified as “Released for Construction” are accompanied by written notification from the Design Manager certifying that the documents were reviewed in accordance with the QA/QC Plan.

Design Review

Design quality control includes review of drawings, engineering computations, and other design related documents for technical accuracy, conformance to Contract requirements, as well as form, content, and spelling. Design quality assurance evaluates whether the designers assessed problems appropriately, applied correct analyses, and assigned qualified personnel to tasks when conducting design related activities.

Design quality control functions are provided by design discipline leads checking completed work and are carried out to a level commensurate with the complexity of the design element. This effort is managed by the Design Manager who ensures formal and documented reviews occur at predetermined times for submitted design documents as identified within the QA/QC Plan.

The process (shown in Figure 4.4.4.1) of checking deliverable documents first involves the creation of the QC Document (a copy of the deliverable) by the Originator (designer, writer, etc.). The QC Document is then dated, reviewed, and “red-lined” as appropriate by the design discipline leads who then return the QC Document to the Originator. The Originator “highlights” the “red-line” comments on the QC Document once the correction has been made or discusses the comments with the discipline leader for final determination, making note of final resolution. The Originator keeps the QC Document for record purposes and as evidence of performing design quality reviews in accordance with the QA/QC Plan.

The Design Quality Assurance Supervisor, Jeremy Beck, PE, ensures that design activities adhere to the QA/QC Plan and records of reviews are kept. He also performs design quality assurance reviews throughout the duration of the Project as set forth in the QA/QC Plan. He ensures and verifies that required quality control functions were performed properly, and in conjunction with the Design Manager, and directs the correction of nonconforming design practices. He ensures design standards, methods, and requirements of the Project are met, professional engineering judgment was applied correctly, and appropriate degree of care was utilized.

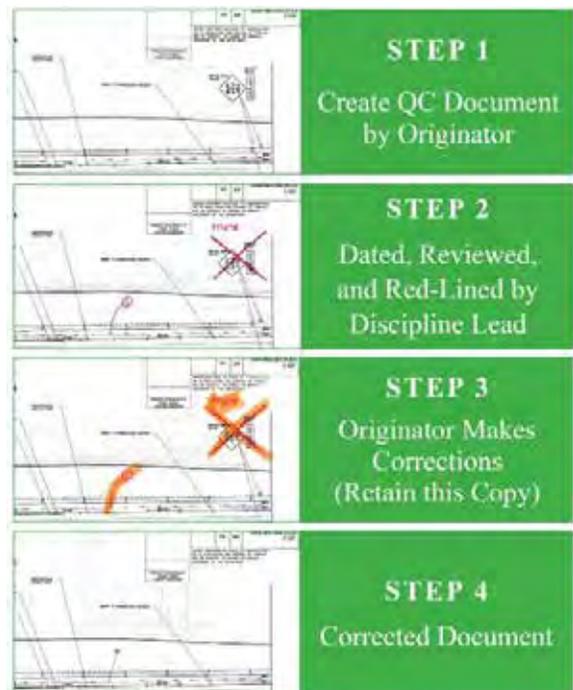


Figure 4.4.4.1 Design Review Step

Interdisciplinary Coordination

Coordination between disciplines is critical to the success of the Project, not just during design, but also during right-of-way acquisition, utility relocation, and construction phases. Interaction between all

4.4 Project Approach

discipline leaders through all phases ensures that Project elements are properly coordinated, and schedule impacts and conflicts are avoided from the outset. During design, weekly meetings are held so details can be discussed and coordinated with the multiple design discipline leaders including roadway, structural, hydraulics, and traffic engineers. Additionally, environmental permitting, utility relocation, right-of-way acquisition, and construction staff are involved to ensure design progresses in a manner which considers long lead items (such as environmental permits or structural steel orders), is compliant with environmental regulations (including consideration and documentation of avoidance and minimization strategies), and matches the required phasing for completion of the Project (such as advancing right-of-way or utility relocation plans on critical properties). Potential conflicts or challenges are recognized and discussed at these meetings, and the entire Project Team is able to efficiently identify alternate solutions. Coordination between disciplines continues beyond the design phase, ensuring that unforeseen situations which may arise are addressed efficiently and collectively throughout the duration of the Project.

Constructability Review

Throughout our Team's history of working on VDOT design-build projects, we have found that regular, informal, over-the-shoulder type reviews from construction personnel work best to produce quality designs. These types of reviews are conducted at weekly internal progress meetings where the Design Manager (and the discipline leads as appropriate) present roll plots and/or developed plans to the construction personnel who are building particular pieces of the Project. Immediate feedback regarding the design is provided and appropriate adjustments are discussed so that unnecessarily difficult, unsafe, or out of schedule construction is avoided. Conversely, explanations regarding design requirements are conveyed to construction personnel, ultimately resulting in a greater overall understanding of Project requirements. This type of on-the-spot review regularly occurs within our design offices between discipline leads and construction personnel, as is typical of all of our VDOT design-build work.

In addition to informal constructability reviews, the Design Manager and Design-Build Project Manager coordinate formal reviews of the design by construction personnel prior to each plan submission. Comments regarding the constructability of the design are provided to the Design Manager for incorporation and/or further discussion prior to completing each design phase.

Quality Assurance and Quality Control of Design and Field Changes

Design changes, including field adjustments, will adhere to the requirements of the QA/QC Plan, commensurate with those applied to the original design. The Design Manager ensures that QA and QC reviews of changes after plan approval occur throughout the duration of the Project. Following completion of design QA/QC review and approval by the Design Manager, each change is submitted to VDOT for concurrence prior to implementation in the field.

Design QA/QC Procedure for One Unique Project Element

A key design issue on this Project will be preparing a stormwater management design that meets the standards and specifications of both VDOT and the Town of Leesburg. The Town of Leesburg has special design requirements for stormwater management such as water quantity control requirements within the Tuscarora Creek watershed, unique BMP design requirements, and Leesburg specific rainfall intensities. These additional requirements, along with the added coordination required with the Leegate development, will further necessitate a rigorous QA and QC procedure that will be implemented by the Team. The stormwater management QA/QC process includes the following:

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- The Team will establish a stormwater management design criteria document that will detail the specific requirements of the VDOT Drainage Manual and the Town of Leesburg Design and Construction Standards Manual (DCSM). This document will serve as the basis for the overall stormwater design;
- Stormwater management designers will meet with representatives from the Town of Leesburg to present the overall Project design as part of a design kickoff meeting early in the process;
- Verification that the site area utilized in the stormwater calculations reflects the total limits of disturbance for the entirety of the Project design. This will include close coordination with roadway, drainage, maintenance of traffic, and erosion and sediment control designs. The site area is verified at several points throughout the design process to verify that all water quantity and quality calculations include the proper area of disturbance;
- Verification all proposed drainage areas reflect the divides from the final roadway profile and cross slopes as well as the final drainage design;
- Coordination with the Leegate development and verification that outfalls onto their property take into account the capacity of all drainage systems being installed as part of their project;
- Check of the Project's outfall flowrates to verification that the peak rates for the applicable storm events do not increase within the Tuscarora Creek watershed;
- Verification that any proposed BMPs meet all the applicable standards of both VDOT and the Town of Leesburg;
- Check of boring logs to determine the groundwater table elevation at each proposed BMP location. Verification that any proposed BMP meets the applicable groundwater separation requirements and all applicable geotechnical recommendations are integrated into the design; and
- Verification that all Project outfalls meet the applicable IIB water quantity control requirements.

The checks on the stormwater management design that are noted above will be performed by the highly qualified individuals that our Team will bring to the Project. These items will assist in verifying that the stormwater design is of the high quality expected as part of this Project and required in the RFP.

Description of Construction QA/QC Procedures

Our Team's Construction QA and QC Procedures, found within our QA/QC Plan, have been established to conform to VDOT's QA/QC Manual. Our Plan stipulates the specific requirements of the Project and implements appropriate Witness and Hold Points for inspection of work at critical stages. These critical inspection points allow for VDOT review and approval and identify inspection requirements by the key members from the Design Team prior to construction activities continuing. Having this level of Design Team involvement in construction activities allows the engineer to confirm that actual construction conditions conform to the parameters anticipated during design.

During construction, the QA and QC Teams follow the established and approved QA/QC Plan. The QA/QC plan is structured to ensure that QC and QA functions are performed independently and that procedures and work products are regularly audited. Key elements of the Construction QA/QC Procedures are summarized in the following paragraphs.

Construction Quality Assurance

The Quality Assurance Manager (QAM), Avtar Singh, PE, DBIA, CCM, PMP, with CES Consultants, LLC, is independent of the Designer, Contractor and QC Team, and is responsible for the Quality Assurance of the roadway, bridge and other physical construction operations, including the independent QA testing technicians. The QAM reports directly to the Design-Build Project Manager and has the authority and responsibility to stop

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work and withhold payment for any work not being performed in accordance with the Contract requirements or lacking the QA/QC documentation necessary to prove that the work meets the Contract requirements. The QAM oversees and directs the personnel responsible for performing QA inspections and testing of all materials used and work performed on the Project. He has personnel representing the QA Team that reports directly to him and are not part of the QC Team.

All QA inspection staff complete daily reports and QA Independent Assurance (QA IA) and Verification Sampling and Testing (QA VST) reports of all quality assurance inspections. The QAM compares QA IA and QA VST results to the QC, Owner Independent Assurance (OIA) and Owner Verification Sampling and Testing (OVST) results to ensure consistency and accuracy at all testing levels. The QAM determines and certifies to VDOT whether the materials and work are in compliance with the approved drawings, specifications, and applicable VDOT standards and reference documents as outlined in the Contract. The QAM ensures that all inspectors have adequate certifications for the testing performed and that copies are maintained in the QAM Project files on site. The QAM has autonomy and the responsibility to coordinate QA inspections and report findings directly to VDOT.

Construction Quality Control

The Construction Quality Control Manager (QCM), Nick Carswell, PE, with Dewberry Engineers Inc., reports directly to the Construction Manager and manages the day-to-day QC inspections and material testing as directed by the Construction Manager. The QCM and the QC Team are responsible for inspection of the construction activities and all QC sampling, testing and analysis of materials on the Project to ensure that construction quality is verified at frequencies exceeding those required by the VDOT Construction Manual, the Materials Manual of Instructions and Tables A-3 and A-4 of VDOT's QA/QC Manual. As the QCM, he assures that the QC materials sampling and testing is consistent with the QC plan.

All QC staff actively inspecting and/or testing segments of work complete an Inspector Daily Report (IDR). The IDR's are electronic dairies in accordance with VDOT's Construction Division Memorandum CD-2000-14 and include, as an attachment, copies of all QC materials tests completed for the day's activities. Signed hard copies of the IDR's are submitted to the QCM on a daily basis for review and approval. The QCM completes an electronic Daily General Report, which summarizes the work covered by the IDR's. Copies of all signed Daily General Reports, IDR's, and test reports are then forwarded to the Construction Manager, QAM and others on the design-build team for use and review while the original documents are placed in three-ring binders, by project and month and maintained as part of the permanent QC records. All binders are stored in fireproof storage cabinets at the Project site and are available for audit by the QAM and VDOT at any time. A weekly report is produced by the QCM that contains summaries of tests, materials placed, actions taken for failing materials, NCR's, safety, inspection, environmental and schedule challenges.

Construction QA/QC Procedure for One Unique Project Element

A key construction issue on the Project will be the safe and high-quality construction of the foundations of the Battlefield Parkway bridge abutments over Route 7. The bridge abutment foundations will be constructed on driven steel H piles to a depth that meets the minimum bearing capacity and pile tip elevation as recommended in the project geotechnical report and shown in the plans. As with every construction element, the construction QA and QC procedures start with the Preparatory Inspection Meeting (PIM). The PIM will be run by the QAM and attended by the QC Manager, QA and QC inspectors, the Construction Manager, Safety Manager, applicable subcontractors, and VDOT personnel, as recommended by VDOT's Construction Manager. During

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the PIM the QAM will discuss the following work features and inspections with input from the Construction Team and VDOT:

- The Construction Manager will describe the plan to complete the work including means and methods and identify the structural crew and equipment that will drive the piles;
- The QAM will list all of the contract documents that cover the planned work, including Bridge Plans by sheet number, specification numbers, hand out copies of relevant special provisions, and the appropriate inspection checklist from the QA/QC Plan;
- The QAM will verify approval of equipment and materials, including ensuring the pile hammer is sized adequately to achieve the necessary driving forces. The QAM will review the source of materials for the piles and concrete to confirm they were submitted and the method of approval has been provided to the inspection staff;
- With each PIM, the QA Manager will discuss any necessary permits and confirm that they have been acquired. For this activity, the VPDES permit will be required for the land disturbance required for excavation to the bottom of the MSE wall where the piles will be driven. The Team will discuss the required E&S controls to ensure they are in place prior to commencement of the drilling, including concrete wash-out locations;
- The Team will discuss the constructability, safety of workers, and public safety considerations including the proximity of equipment and operations to the traveling public. The QAM will document special safety considerations in the PIM minutes for further assessment during construction;
- The QA Manager will review the inspection checklist and describe all testing requirements, including test pile procedures. The QA and QC Managers will identify the QA and QC staff responsible for the inspections and testing. Additionally, the QA Manager will identify any required inspections by either members of the Design Team or Design/Build Team members other than QA or QC. For the pile activity, the QAM will identify the planned inspection by the Geotechnical Engineer to confirm the bearing capacity of the MSE wall and piles and confirm that the conditions encountered during construction match those anticipated by the geotechnical report for this activity; and
- Finally, the QAM will identify any witness and/or hold points, including a witness point for VDOT to observe and participate in the inspection by the geotechnical engineer.

Following the PIM, the QAM will distribute minutes of the meeting that document the meeting discussions and include the relevant inspection requirements that will be referred to by the QA and QC inspectors during construction.

Once construction starts in the field, the QA and QC inspection staff will utilize the PIM minutes and Load Bearing Pile Inspection Checklist to ensure that that all inspections are completed and documented in the Daily Report. Prior to the start of physical construction, the QC inspector will verify and document the following:

- Sublet request for any subcontractors are approved and the certificate of insurance is up-to-date and on file;
- Piling materials are the correct size and appropriate length according to the plan. Delivery tickets and certifications for the materials are in accordance with the approved source of materials and meet the specifications and special provisions;
- E&S Controls are installed around the work area in accordance with the approved E&S Plans and in compliance with the VPDES Permit;
- Equipment positioning and material staging is in accordance with the PIM discussions and a site safety review confirms that site conditions are consistent with the plan of operations and worker and public

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safety protections are in place;

- Survey controls and pile layout matches the proposed pile layout in the bridge plan; and
- As the pile will be driven from the subgrade of the MSE Wall, the QC inspector will notify the Geotechnical Engineer of Record (EOR) when the subgrade is prepared so that the Geotechnical EOR can verify the foundation material and bearing capacity for the MSE fill. This will be a hold point in the CPM Schedule.

Once pile driving work begins, the QA and QC inspections will continue for verification and documentation of the following:

- The QA and QC inspectors will monitor the Dynamic Pile testing at each foundation location and document the results in their inspection reports;
- During driving the QA inspector will verify that the activity is being continuously inspected by a full-time QC inspector dedicated to the activity;
- As the piles are set, the QC inspector will verify placement in accordance with the stakeout, ensure that any specified pile points are properly welded to the end of the piles and vertical alignment of the pile is maintained prior to and during driving;
- The QC Inspector will verify that the pile hammer type and model match the equipment that was submitted and approved for the activity.
- The QC inspector will continuously monitor the driving operation, documenting the blow counts and the depth of driving and confirming when the pile bearing is achieved; and
- During the process, the QA inspector will perform periodic joint inspections of all operations. The QA inspector will be present for the Geotechnical Engineer's inspections and will review pile driving inspection reports and center of gravity calculations. The Lead QA Inspector will coordinate with VDOT to ensure that Owner IA and Owner VST tests are completed and will compare the results of all levels of tests to confirm consistent results. The QA inspections, tests, and comparison results will be documented in the QA Inspectors daily report.

Following completion of all piles at a given foundation element, the QC Inspector will complete a center of gravity calculation for the piles. The center of gravity calculation and dynamic pile testing results will be reviewed and approved by the Bridge Design Engineer of Record prior to pouring the concrete foundation above the piles.

The Quality Assurance and Quality Control procedures described above along with the qualified personnel that our Team is bringing to the Project will ensure that the operations will be carried out in accordance with the high quality standards established in the Contract requirements.

QA/QC Staffing Plan

The personnel selected as our QA/QC Team provides VDOT with unparalleled experience and understanding of the quality processes and coordination needed to successfully deliver the Project. Our design and construction staff have worked together and for VDOT for over 16 years and are responsible for assembling and overseeing our QA/QC Plan. A description of our QA/QC staff and duties are listed on the following page:

4.4 Project Approach

Design Build Project Manager

As Design Build Project Manager (DBPM), **Jeffrey Austin, PE, DBIA**, provides supervision and administrative management of the entire project including the overall design and construction and reports at the executive level. He establishes the QA/QC program and adjusts the process as needed to assure quality of design and construction.

Quality Assurance Manager

Avtar Singh, PE, DBIA, CCM, PMP, is the Quality Assurance Manager (QAM) and is responsible for the development of and adherence to the QA/ QC Plan, ensuring all work and materials, as well as testing and sampling, are performed in accordance with the Contract and approved construction plans and specifications. He has full authority to initiate work stoppage and to withhold certification for payment for design or construction activities that are not in compliance with the Contract Documents - this authority will be made in writing by the DBPM as part of the QA/QC Plan.

Quality Assurance Testing and Inspection

CES Consulting, LLC provides two full-time Quality Assurance Inspectors (one Roadway, one Structural) supplemented by additional inspectors to ensure quality assurance testing and inspections of work items is performed, QC inspections are observed, and correction of non-conformities are completed in accordance with the Contract documents. The Lead Roadway QA Inspector will be Mostafa Kalani and the Lead Structural Inspector will be Raed Jaff. All QA inspection staff will report directly to our QAM. **Dulles Geotechnical & Materials Testing Services** will perform QA laboratory testing for the Project. Based on the scope of the work and our preliminary schedule of construction activities, we anticipate a maximum QA Staff of five (5), including the part-time QAM, two (2) full-time Lead QA Inspectors, part-time office engineer and part-time support inspectors/technicians, to be on-site during construction. Dulles Geotechnical & Materials Testing Services is an AMRL and CCRL certified laboratory and is independent from QC laboratory testing on the Project.

Design Manager

Steve Kuntz, PE, DBIA, directs and coordinates the design process including work by sub-consultants and is accountable for the design QA/QC Plan. He is responsible for implementing, monitoring, and as necessary adjusting the Design QA/QC Plan to ensure acceptable quality of the design work.

Design Quality Assurance

Jeremy Beck, PE, is responsible for quality assurance of design elements included in the Project. Following completion of quality control reviews he performs a complete QA review of all design documents prior to submission to VDOT.

Independent Design QC Reviewers

Independent Design QC Reviewers perform the design QC function on each design element. The Design QC reviews are completed by qualified independent reviewers who do not have a direct role in the design development or the QA review function.

Construction Manager

Eric Andrews is the Construction Manager and is accountable for day-to-day construction operations, the construction portion of the QA/QC Plan, and for ensuring construction is in accordance with the Project requirements. He is on the Project site for the duration of construction operations and will coordinate and schedule all QC inspections.

Construction Quality Control Manager

Nick Carswell is responsible for construction quality control and oversees construction quality control testing and inspection operations. Reporting to the Construction Manager, Nick assigns inspectors and testing technicians for each work package and monitors reporting documentation to ensure that the work packages were completed in conformance with the contract requirements.

Construction Quality Control Inspections and Testing

Together, **Dewberry Engineers Inc. & GeoConcepts Engineering, Inc.** are responsible for quality control testing and inspection of construction activities for conformance with the QA/QC Plan and Project related documentation. They possess current VDOT materials certifications for the types of testing and/or inspections they are assigned to complete. Based on the preliminary schedule and overlapping work activities, we anticipate a QC staff of five inspectors and testing technicians including the QCM, two lead inspectors, and support inspectors/technicians, to be on-site during construction. The number of QC inspectors and technicians will fluctuate during slower periods and peak construction timeframes to match the workload. GeoConcepts Engineering provides the independent AMRL and CCRL certified QC Laboratory to perform all QC laboratory tests.

4.5 Construction of the Project



4.5 Construction of the Project

4.5.1 Sequence of Construction

The Route 7/Battlefield Parkway Project is unique in that the existing intersection is permitted to be closed during construction for no longer than 12 months. While this approach will shorten the overall duration and impact to the public, it imposes a higher level of competency on the Design-Builder to develop and implement a coordinated, well-planned design, schedule and sequence of construction. The Shirley Team has embraced this challenge in all aspects of the Project starting with the overall interchange concept. After reviewing and evaluating multiple options for the interchange, it quickly became apparent that the SPUI concept minimizes the risk of schedule delays for two main reasons: (1) the concept has already received approval from the Town of Leesburg, VDOT and the public, avoiding the schedule uncertainty of having to vet a different concept, and (2) our Team’s specific experience with the sequence of construction and level of effort required to construct a SPUI maximizes schedule certainty.



The limited timeframe for the detour of Battlefield Parkway not only mandates a well-planned and coordinated sequence of construction, but a commitment to providing multiple resources simultaneously throughout all phases of the work. A key component of our efforts is to maximize the overall construction time available by closely coordinating the work with design, permitting, right of way, and utility relocations. Our plan prioritizes traffic operations and the safety of the traveling public, construction personnel and all other stakeholders. Building on our extensive design-build experience, familiarity with the Project corridor, available resources, and relationships with the major stakeholders, including VDOT and the Town of Leesburg, our Team’s approach will ensure schedule certainty and reduce risk of delays.

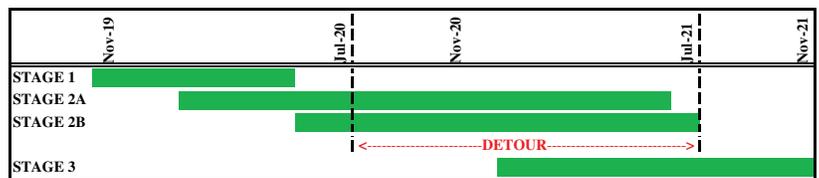


Figure 4.5.1.1

As demonstrated by our Proposal Schedule in Section 4.6, our construction sequence is organized into three major Stages which are directly coordinated with the pre-construction activities, right-of-way acquisitions and utility relocations, while maximizing opportunities for concurrency, as highlighted in Figure 4.5.1.1. Each Stage is subdivided into geographical areas to include Route 7, Battlefield Parkway, interchange ramps, the bridge structure, and other major components. From the beginning, we have structured our construction sequence to account for the 12-month limitation of the Battlefield Parkway detour. Our sequence of construction is outlined as follows:

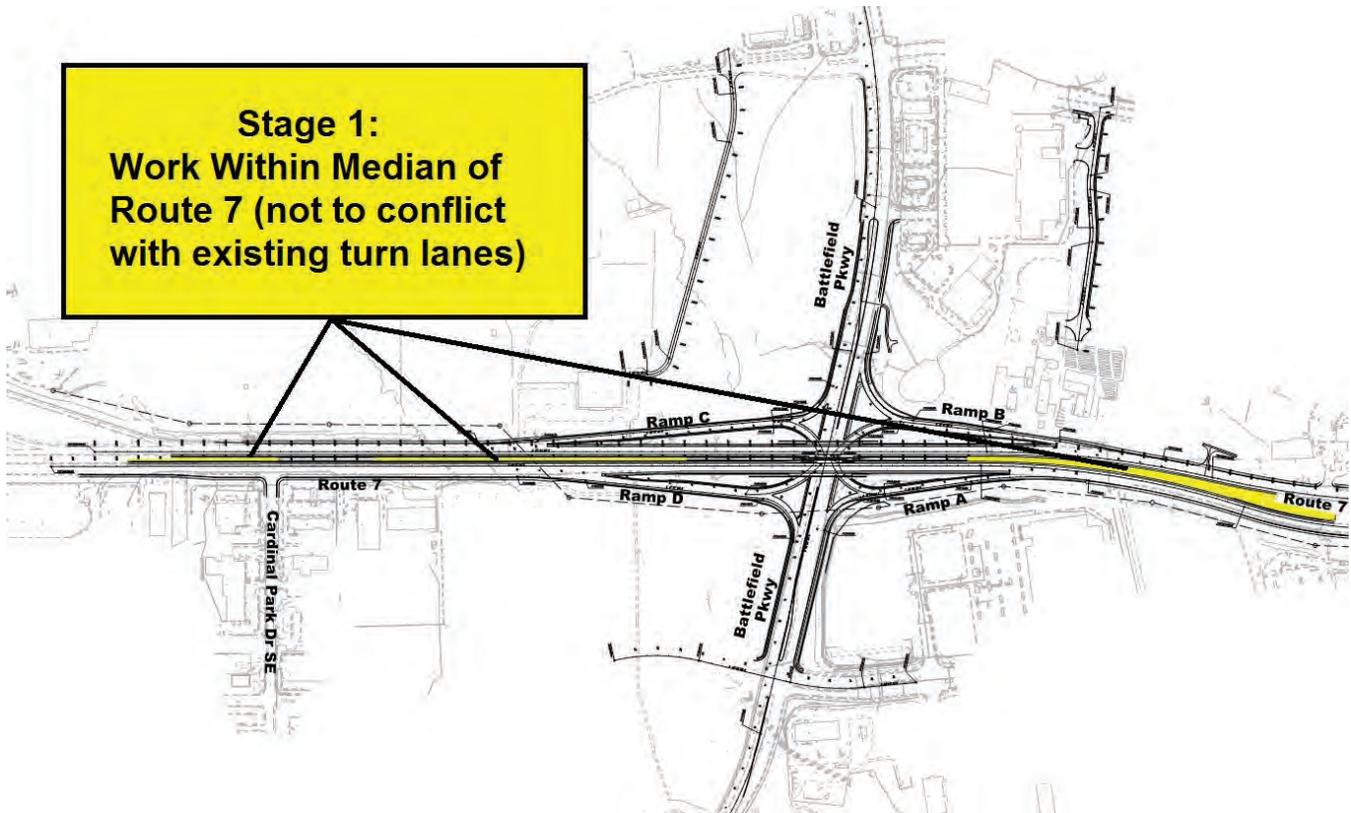
Stage 1 - Fall 2019 to Spring 2020

Construction in Stage 1 will focus on work that can be performed concurrent with the ROW and easement acquisition process, and utility relocations, thus maximizing the overall construction duration. Stage 1 work will primarily be performed in the Route 7 median and consist of:

- Installation of initial TTC and E&S Controls;

4.5 Construction of the Project

- Excavation & rough grading;
- Installation of new storm drainage; and
- Preparation work for utility relocations to be completed in subsequent Stages.

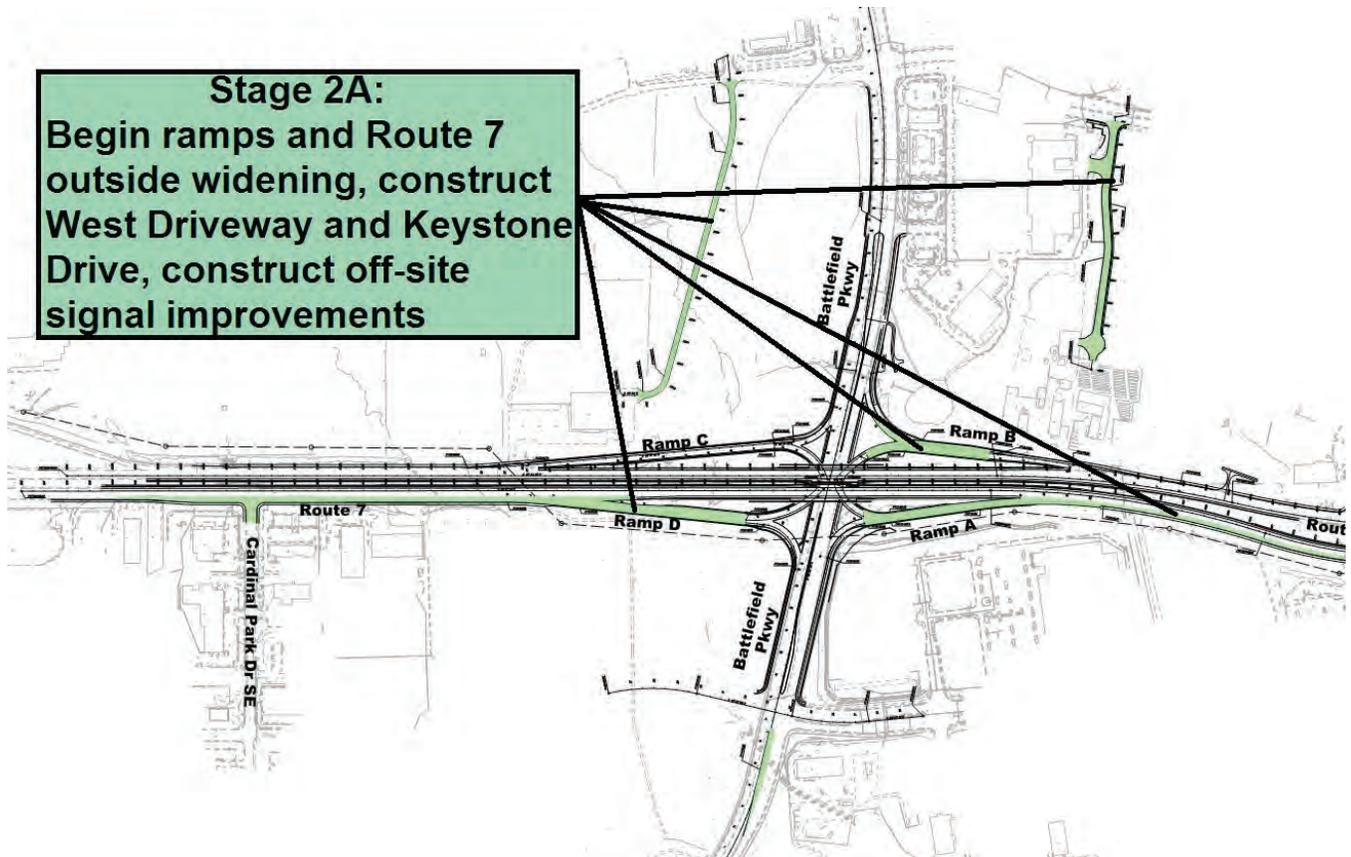


Stage 2A - Spring 2020 to Spring 2021

As ROW is obtained, work in Stage 2A will focus on activities that can be completed prior to the start of the Battlefield Parkway detour period. These include:

- Clearing and grubbing;
- Installation of E&S Controls;
- Utility relocations to the outside of both Route 7 and Battlefield Parkway;
- Construction of West Driveway and Keystone Drive;
- Improvements to the off-site intersections required for the Battlefield Parkway detour;
- Retaining walls and embankment fills for ramp construction;
- Ramp construction not in conflict with existing roadways;
- Route 7 widening at the tie-ins to the proposed interchange ramps;
- Permanent signing including new overhead sign structures; and
- Construction and modification of SWM Ponds and BMP's.

4.5 Construction of the Project

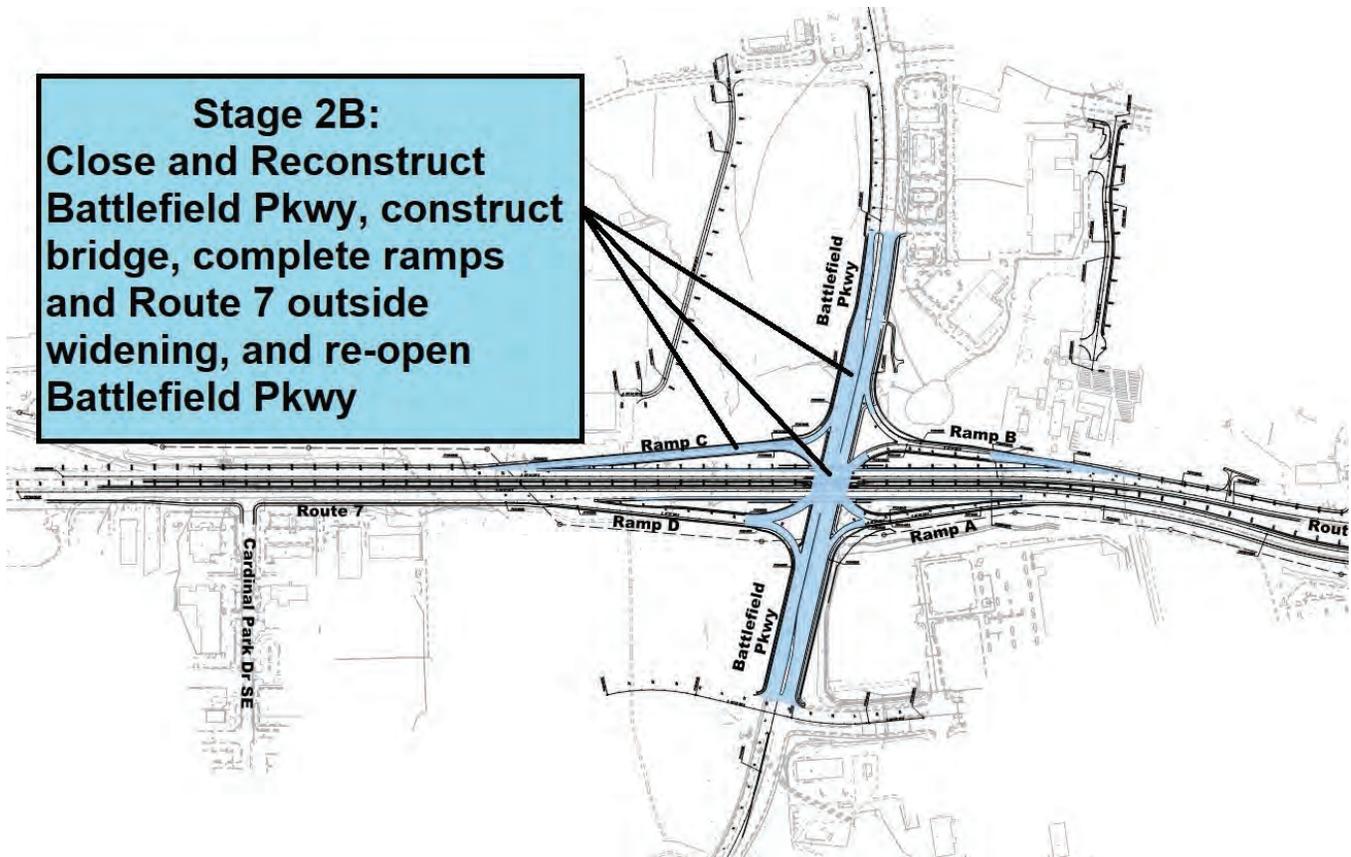


Stage 2B - Summer 2020 to Summer 2021

Stage 2B begins and ends with the implementation of the Battlefield Parkway closure and detour. Construction will focus on all work to construct the proposed bridge structure, roadway approaches and interchange ramps for the new interchange within the 12-month allowable timeframe. This work will include:

- Close Battlefield Parkway at Route 7 and implement the detour;
- Remove the existing signal at Route 7/Battlefield Parkway;
- Demolition of the existing Battlefield Parkway pavement;
- Placement of new embankment, storm sewer, and pavement structure for the Battlefield Parkway bridge approach roadway;
- Construction of bridge structure over Route 7;
- Completion of remaining ramp construction and tie-ins to the new bridge structure;
- Completion of work on Route 7 at the new bridge abutments and pier; and
- Open the new interchange to traffic and removal of the detour.

4.5 Construction of the Project

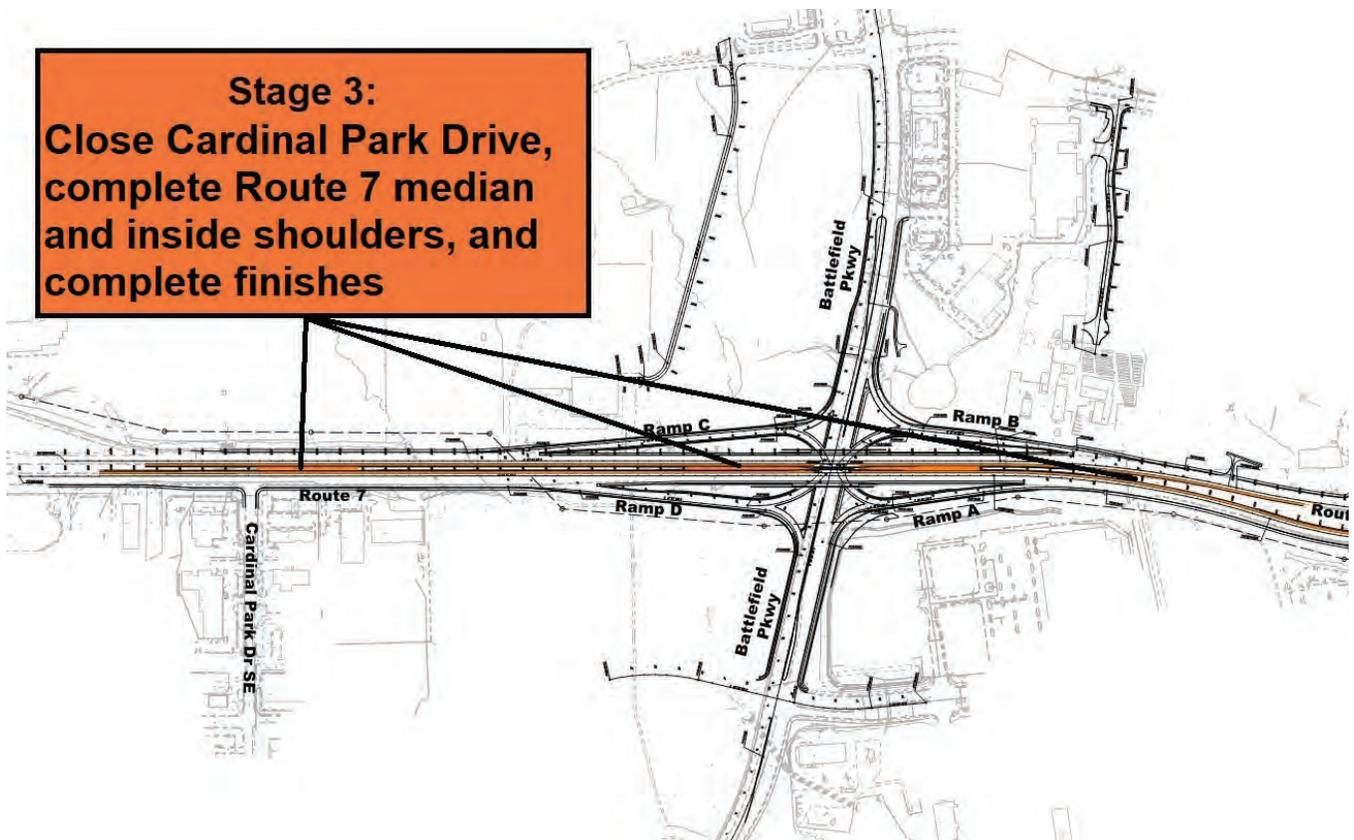


Stage 3 - Spring 2021 to Fall 2021

Stage 3 primarily encompasses the finish activities such as surface pavement, pavement markings, signing, grading, stabilization, and completion of SWM Ponds, many of which will be pursued while the detour is in place. Construction will include:

- Permanent closure of the Route 7/Cardinal Drive intersection;
- Completion of the median work on Route 7;
- Completion of Route 7 median shoulders;
- Installation of pedestrian facilities and roadway lighting on Battlefield Parkway;
- Final surface paving and permanent pavement markings;
- Completion of SWM Ponds including access roads and fencing; and
- Final grading and stabilization.

4.5 Construction of the Project



A detailed description of our Sequence of Construction follows and is shown in our Proposal Schedule included in Section 4.6:

Sequence of Construction - Stage 1

Due to the risk of schedule delays associated with the Utility Relocation and the Right-of-Way acquisition processes, our Team's Sequence of Construction is designed to mitigate those risks by maximizing construction within areas of existing right-of-way and minimal utility conflicts. Stage 1 focuses on work in the median of Route 7 that meets these objectives.

Work in Stage 1 will start with the placement of temporary concrete barrier to safely access the median of Route 7 without the need to shift the existing travel lanes. This provides the benefit of maintaining the full existing lane widths and eliminates the need for temporary pavement markings and eradication, which minimizes the occurrence of potholes and other maintenance concerns. Once traffic control measures are installed, work in Stage 1 will include:

- **Route 7 Median Drainage and Grading:** Activities will include earthwork, grading, and installation of new box culverts and storm drainage in the median and crossings of Route 7 in both directions to the outside. Once the drainage and earthwork activities are complete, the areas will be finish graded and stabilized, thus allowing removal of the temporary traffic control devices. During Stage 1, all existing thru and turn-lanes on Route 7, Battlefield Parkway and at the Route 7/Cardinal Park Drive will remain open.

4.5 Construction of the Project

Sequence of Construction - Stage 2A

Stage 2A work will focus on maximizing construction in areas of cleared ROW in advance of the implementation of the detour, such as utility relocations and ramp construction. However, work will continue in these areas and will overlap with work in Stage 2B. In addition, Stage 2A will prioritize construction of the West Driveway and Keystone Drive access roads to maintain access to the properties and businesses served by them. Major areas of work for Stage 2A will include:

- **Route 7 – EB/WB Outside Widening Between Battlefield Parkway and the Eastern Limits:** Temporary traffic controls will be installed to access the outside widening of both EB and WB Route 7 between Battlefield Parkway and the east end of the Project, with traffic shifted towards the median onto a strengthened shoulder where necessary. Work in these areas will focus on preparation for utility relocations and permanent ramp work in this Stage. This will include clearing and grubbing; demolition of existing curb, guardrail and pavement; and striping top soil for preparation of earthwork fills. Any new storm drainage and roadway construction along Route 7 that can be completed within existing ROW will also be completed.
- **Route 7 – EB Outside Widening Between the Western Limits and Battlefield Parkway:** Temporary traffic controls will be installed to access the outside widening of EB Route 7 between the west end of the Project and Battlefield Parkway, with traffic shifted towards the median onto a strengthened shoulder where necessary. Work in this area will begin with installation of E&S controls; demolition of existing curb, guardrail and pavement; initial earthwork activities; and the box culvert extensions. Utility relocations will commence including overhead and underground dry utilities, and relocation of existing water and sewer. Once the utility relocations are completed, earthwork and storm drainage will continue, and the new pavement structure tying into Ramp D will be constructed.
- **Partial Ramp A Construction:** As there is a significant portion of Ramp A that can be constructed within existing ROW, work will begin to construct the proposed retaining wall, embankment fill and pavement structure tying to Route 7.
- **Partial Ramp B Construction:** Work will begin for Ramp B permanent construction, consisting of embankment fill within existing ROW limits. Proposed storm drainage and initial modifications to the existing SWM Pond will also commence in this Stage.
- **Partial Ramp D Construction:** Within the existing ROW Limits, work will begin to construct the MSE retaining wall and embankment fill for proposed Ramp D.
- **Overhead and Ground Mount Signing:** Overhead and ground mount signing will be installed during Stage 2A to accommodate the Battlefield Parkway detour and the ultimate final interchange configuration.
- **Detour Intersection Improvements:** Prior to implementation of the detour, critical intersection improvements at River Creek Parkway/Russell Branch Parkway and Battlefield Parkway/Fort Evans Road will be completed. To maximize the benefits to the public, these improvements will be completed in advance of the detour and represent our Team’s Unique Milestone #1.
- **West Driveway:** After ROW is acquired, the proposed West Driveway will be completed prior to closing the existing access to Parcel 011 from WB Route 7. This is scheduled to be completed by the summer of 2020 and represents our Team’s Unique Milestone #2.
- **Keystone Drive:** After ROW is acquired, multiple utilities will be relocated concurrent with the new roadway construction. Keystone Drive will be completed prior to closing the existing access to Parcels 014 and 015 from WB Route 7. This is scheduled to be completed by the summer of 2020 and represents our Team’s Unique Milestone #3.

4.5 Construction of the Project

Sequence of Construction - Stage 2B

Stage 2B construction primarily consists of constructing the new interchange during the 12-month detour timeframe. Portions of this Stage will overlap with Stage 2A work and begins when the detour is implemented.

- **Battlefield Parkway Bridge over Route 7:** Once the detour is implemented, demolition of all existing roadway elements on Battlefield Parkway will be completed. This includes the signal at Route 7, asphalt paving, curb and gutter, guardrail, signage, and lighting. Traffic control devices will be placed along Route 7 to protect the work zones for the bridge pier and abutments.

Bridge construction will then begin immediately in multiple areas concurrently. As discussed in Section 4.3.2, we have selected MSE wall abutments with driven pile foundations at the abutments to minimize the geotechnical schedule risks of settlement and adequate bearing material associated with spread footings. In addition, the MSE wall select backfill can be placed concurrent with the roadway approach fills, a further benefit to the schedule compared to a cast-in-place abutment that would have to achieve strength prior to fill placement. As the soil borings included with the GDR indicate rock at a higher elevation, spread footings will be utilized at the pier foundation.

We have sequenced the work so that the pile driving crew can start on one abutment while a different structural crew is working at the pier foundation. When complete, the pile driving crew will move to the other abutment while MSE wall crews follow to construct the first abutment wall. After all piles are driven, additional MSE crews will mobilize to complete the second abutment wall. As each is complete, structural crews will follow to build the abutments and beam seats. Concurrently, the structural crew will continue building the center pier columns, caps and beam seats.

As the bridge substructure elements are being construction, grade crews will be placing fills for the roadway approaches on both the north and south sides of the bridge on Battlefield Parkway. An advantage of the MSE wall abutment configuration is that, due to the closure of Battlefield Parkway, there will be ample storage space to stockpile materials in advance of wall construction. This will reduce the risk of schedule delays associated with material deliveries and adverse weather conditions during construction of the walls and approach fills.

Following completion of the substructure work, erection of structural steel will proceed. Shear studs, stay-in-place (SIP) deck forms and deck overhangs will be installed concurrently to further reduce the overall bridge duration. Installation of deck rebar and deck concrete placement will follow. Once strength is achieved, installation of parapets, sidewalks, railing, fencing, lighting, bollards, grooving, and pavement markings will then be completed. Finally, the signal will be installed and tested. Concurrent with the finishing work on the bridge, crews will complete approach slabs, and tie roadway asphalt into the bridge for the ramps, spurs and Battlefield Parkway approaches.

- **Ramp A, B, C and D Construction:** The remainder of Ramps A, B, C, and D construction will be completed concurrent with the bridge construction. For Ramps A and D, this will include completion of retaining walls started in previous stages and embankment fills that will tie into the south Battlefield Parkway approach fill. Fills on Ramp B and C will also be completed concurrent with the north Battlefield Parkway approach fill. Ramp construction activities will include the new pavement section, signing and guardrail.

4.5 Construction of the Project

- **Battlefield Parkway North and South Roadway Approaches:** Both approach roadways on the north and south side of Route 7 on Battlefield Parkway will be constructed concurrently by multiple crews to ensure the work is completed on schedule. The main schedule driver for completion of these approaches will be placement of the mass embankment fill. On the north approach, a new sanitary sewer crossing will be installed. The storm sewer system and modified SWM Ponds will be completed. Curb and gutter and new pavement sections will be constructed along with conduit and junction boxes for the new interchange signal, roadway and pedestrian lighting. Additional signal modifications will be completed for the Battlefield Parkway intersections with Russell Branch Parkway and the Potomac Station Shopping Center entrance.
- **Route 7 - WB Outside Widening to the Western Limits:** Previously installed traffic control devices will remain in place during this Stage and will be extended from Battlefield Parkway to the western limits. Once new ROW and easements are acquired, work will commence to prepare the areas for utility relocation work. This will include installation of E&S controls, clearing and grubbing, storm drainage, and earthwork activities. Utility crews will prioritize relocation of existing underground communication lines along WB Route 7 that are in conflict with the proposed work at the interchange, bridge and future ramps. Once the utilities are relocated, work will continue to construct earthwork, storm drainage and the new pavement section to tie into Ramps B and C.
- **Opening of the Interchange:** Upon completion of the bridge structure, Battlefield Parkway roadway approaches and new Ramps, the interchange will be opened to traffic. All detour signage and associated traffic control devices will be removed.

Sequence of Construction - Stage 3

- **Route 7 Median Widening:** As Stage 2B outside widening is completed, Route 7 traffic will be shifted towards the outside, providing the room necessary to complete the widening of Route 7 in the median in both the EB and WB directions. This includes any remaining pavement demolition, storm drainage elements, earthwork, pavement section, signs, guardrail and median barrier work at the bridge pier. The Route 7/Cardinal Park Drive intersection signal will be removed and the Route 7 crossover closed upon opening the Battlefield Interchange.
- **Finish Construction:** Work will then focus on final grading and stabilization, milling and final surface paving, pavement markings, and remaining sign installation throughout the Project. Work in Stage 3 will be coordinated to minimize impacts to the traveling public, and most of the final milling, paving and pavement marking work is anticipated to be completed during night-time hours during low traffic volumes. Pedestrian facilities on Battlefield Parkway and roadway lighting will also be completed, along with any remaining work at the SWM Ponds and BMP's. Finally, the inspections, punchlist and acceptance process will be completed and the Project will achieve Final Completion.

Safety Considerations

It is our Team's number one goal to ensure the safety of the traveling public and the workers on the Project. We fully support the Owner's commitment to safety of the public, safety of its employees, and safety of all stakeholders, and we plan to align our Team's vision of safety with the Owner. We expect every individual to be involved, empowered, and accountable for Project safety.

4.5 Construction of the Project

Safety Approach

Our Team's approach to safety is based on five primary facets each presenting their own safety challenges:

- Construction Safety;
- Implementation of Safety Controls;
- Public/Traffic Safety;
- Knowledge and Training; and
- Proactive Safety Culture.

Construction Safety - Each component of the Project, including the earthwork, bridge, TTC, and utility installation, have distinct safety challenges. We will work closely with our design Team to finalize a design that incorporates and considers safety elements, and fully integrates anticipated construction processes and staging requirements.

Implementation of Safety Controls:

- **Design** - A safe design is only safe if it can be constructed safely. Proper allowances will be integrated into our planning for equipment placement, material staging and storage, safe and secure work zones, as well as safe and efficient construction access points and entrances.
- **Schedule** - Design and planning phases for work impacting the traveling public will be evaluated to address safety exposures, duration of operation and traffic impacts. Based on the evaluation, the proposed work will be scheduled for the day or night shift as applicable.
- **Safety by Contract** - Our Team develops a Project Specific Safety Plan that will also be enforceable by our subcontracts, outlining Project safety requirements including OSHA/VOSH related safety provisions for our subcontractors.
- **Safe Start Process** – Everyone working on the Project is required to complete our Safe Start program prior to starting work. Some key aspect of this process include task specific Job Hazard Analyses (JHA), Hazard Communication Plans, and Fitness for Duty Certifications. The Team will meet individually with each subcontractor's onsite field supervision and Project Manager to establish clear safety goals for the Project and expectations from subcontractors.
- **Utility Strike Prevention** - Area specific integrated work plans (AWP) are generated by the Project Team. Each AWP incorporates a utility overlay for the proposed work area used in the preconstruction meetings and during construction. The preconstruction meeting includes all management personnel and field craft labor to review potential utility risks and develop the Safe Plan of Action (SPA). All personnel in the meeting agree to the SPA and sign the AWP document prior to entering the work area. The plan is a living document that will be revised as utilities are relocated and construction progresses.
- **Worker Orientation** - All workers must complete safety and environmental orientation before entering the jobsite. The site-specific orientation includes a comprehensive review of HS&S, safety policies and environmental risks. Hardhat stickers are provided to all employees certifying completion of orientation and are valid for one year. All workers will attend a new orientation annually to ensure safety awareness and compliance. The stickers assist in identifying subcontractor employees that may not have been through the safety orientation as different subcontractor crews are assigned to the site.
- **Safe Plan of Action (SPA)** - A daily SPA meeting or "Take 5" is our forum to communicate each day's safe work plan to all workers. Each foreman and crew, including subcontractors, will review their AWP, tasks, required tools, potential hazards, and related safe work protocol. During this meeting, all employees will participate in a "stretch and flex" session. Useful in prevention and treatment of soft tissue injuries, including sprains and strains, stretch and flex programs have been proven to enhance balance, coordination and circulation. Stretching increases flexibility, which directly translates into the reduced risk of injuries.

4.5 Construction of the Project

- **Superintendent/Foreman Meetings** - Our Team's superintendents and Safety Manager meet with foremen and subcontractors every week to discuss current safety concerns and the proposed plan to resolve them. The week's area work plans are reviewed so all crews are aware of other construction activities.
- **Safety Stand Down Meetings** - Safety Stand Down Meetings are declared by the DBPM or the Construction Manager. Stand Down meetings cease all work on the Project to address serious violations/incidents or addressing troubling safety trends.
- **Monthly Safety Meetings** - Each month, the Construction Manager assembles all crews to discuss safety conditions and safety trends. These meetings afford all workers the opportunity to speak directly with the Construction Manager and superintendents about safety concerns and/or ideas to enhance safety. If a safety incident has occurred, the root cause and best practices to avoid repeating the incident are discussed.

Public/Traffic Safety

Our Team's Transportation Management Plan, Temporary Traffic Control Plans, and Sequence of Construction have all been developed to provide the safest work zones while attaining the peak operational capacity of the roadway. Following traffic counts at the onset of design, all plans will be adjusted to allow the maximum flow of traffic through the corridor. During construction, the VDOT Work Zone Safety Checklist will serve as the minimum standard to assure conformance with the Project's safety requirements, and checks will be performed daily. Recognizing the importance of public safety, several of the safety improvements that exceed the requirements of the RFP include:

- Use of wet reflective pavement markers through the work zone to better define travel lanes;
- Use of PCMS's to keep the traveling public and local stakeholders informed of upcoming traffic pattern changes and/or closures;
- Installation of oversized "No Turn" signs for clarity when the detour is implemented; and
- Immediate removal of the existing Route 7/Battlefield Parkway signal mast arms the night the detour is implemented to minimize driver confusion.

Knowledge and Training

- **Training** - Using Key Performance Indicators (KPI), the management team can identify safety trends and tailor specific safety training to address the trends. Additionally, our Team uses the winter months to provide ongoing safety training for our employees and subcontractors. Training is performed by in house professionals, subcontractor safety personnel and third-party vendors.
- **Technology** - In addition to requiring all motorized vehicles and equipment to have operational backup alarms, our Team is testing backup cameras and proximity sensors for our trucks and equipment. We are also researching technology advances to identify and avoid underground utilities during excavation activities.
- **Adaptation** - Construction is a constantly changing environment requiring modifications to plans and procedures. As an example, the introduction of the smart phone to the construction industry has benefited communications, but has also introduced an enormous hazard for those working in an already dangerous environment. Much like the distracted driver using the cell phone in front of you, incidents resulting from distracted operators is on an exponential rise. In response, our Team prohibits the use of cell phones while driving or operating machinery onsite.

Proactive Safety Culture

4.5 Construction of the Project

Safety Motto - The Project Team will develop a Project-specific safety motto that will be printed on safety vests, hard hat stickers and banners at the Project office. These mottos, especially when created by the Team, have been a great success in promoting safety awareness.

“Why I Work” Badge - Team employees and subcontractor employees are provided clear badges for their safety vests with “Why I Work” printed on top. Employees primarily place pictures of their children, spouses, parents, etc. for everyone to see. As many of our employees and those of the subcontractors are not familiar with each other, the badges have proven to be an effective way to “humanize” employees to each other and foster an atmosphere of respect and friendship

Operations

The Operations discipline focuses on maintaining the highest possible level of traffic operations and minimizing public inconveniences during construction. Our Team will implement the following to achieve these operational goals:

- Opening the Battlefield Parkway Interchange prior to the start of the 2021 school year and avoiding impacts to school bus routes;
- **Unique Milestone #1** – Commitment to opening the offsite intersection improvements early, no later than January 15, 2020;
- **Unique Milestone #2** – Opening the West Driveway by June 23, 2020. This will remove ingress/egress to several businesses and sports field from Route 7 to a secondary road;
- **Unique Milestone #3** – Opening Keystone Drive by August 27, 2020. This will remove ingress/egress to several businesses from Route 7 to a secondary road, and complete construction adjacent to Tolbert Elementary School prior to the start of the new school year; and
- Prohibiting project deliveries and construction traffic from using Potomac Station Drive due to proximity of the elementary and middle schools along this route.

Staging and Storage

Our Team understands that a clean, orderly project improves public perception and safety for all involved. As with all of our projects, storage of materials will be isolated to areas where safe delivery access can be provided while ensuring that no material is stored in a location which would introduce a hazard (such as obscuring line of sight) to the traveling public, construction, or inspection staff.

We will coordinate deliveries well ahead of time with our suppliers to ensure all parties are aware of any restrictions and locations of where the materials are to be delivered to. Material deliveries will be made from Battlefield Parkway whenever possible to minimize deliveries impacting Route 7 for both traffic flow and safety concerns. Materials not required for immediate construction needs will be stored off site until needed but will be fabricated and ready for delivering ahead of time. This will be critical for retaining wall and bridge construction work to be completed during the Battlefield Parkway closure period. These materials may include structural steel, MSE wall panels and straps, reinforcing steel, bridge railings, fence, signals, and signs.

Construction staging will be immediately adjacent to the proposed construction activity where practical. Where clear zone distance or line of site restrictions prohibit staging and storage of equipment and materials, they will be transferred to and from the site until the activity is completed.

4.5 Construction of the Project

4.5.2 Transportation Management Plan

Our Team is dedicated to delivering this Project in a way that maximizes public safety and minimizes public impacts during construction. All aspects of our Transportation Management Plan (TMP) and the TTC Plans will be developed with a focus on maximizing safety for the traveling public and construction personnel while minimizing travel delays and access impacts throughout all stages of construction. We are also committed to a robust public communications program throughout the project life cycle to communicate and mitigate construction impacts. To accomplish these safety, mobility, and communication goals, **we have committed to numerous enhancements that exceed the requirements of the RFP**. These strategies include:

- Re-counting traffic and re-optimizing detour signal timing after implementation;
- Utilizing enhanced safety devices such as higher visibility “wet reflective” markings;
- Concrete barrier protection along Route 7 for improved safety;
- Monitoring of work zone and detour conditions throughout construction by our MOT engineer;
- Use of specialty signs to guide the public to businesses during construction;
- Use of public communication strategies, such as additional stakeholder meetings; and
- Designing all lane shifts for full desirable criteria (twice as long as minimum criteria).

TMP Philosophy

Our TMP and construction program is focused on reducing the Project’s anticipated impacts to the traveling public, and **exceeding the safety requirements of the RFP**. Above all, our Team values vehicular, pedestrian, and construction personnel safety as our highest priorities in every facet of design and construction. Our TMP will place a heavy focus on eliminating the need for temporary lane closures along Route 7, as we understand the impact lane closures can have on this heavily congested roadway.

To meet our high safety and mobility standards, the TTC and TMP plan development will be led by our Lead Maintenance of Traffic Engineer, Jerry Mrykalo, who is a Professional Traffic Operations Engineer (PTOE) and a certified VDOT Work Zone Traffic Control Training Instructor. Jerry was the lead traffic engineer for the design of nine different projects along Route 7, allowing him to understand the unique safety and mobility considerations of this corridor. **As an additional enhancement that exceeds the requirements of the RFP and demonstrates our commitment to safety, our design engineers have completed our in-house Work Zone Traffic Control Training Program and are all VDOT certified in the development of TTC and TMP plans.** Additionally, we commit to holding a project-specific safety training workshop for construction personnel, VDOT staff, and first responders prior to commencement of major construction activities.

Maintaining Traffic Through all Phases

As introduced in Section 4.5.1, the Project will be constructed in three major Stages. These Stages maximize public safety, minimize public impacts, and allow for the timely opening of the interchange within 12 months of closing Battlefield Parkway. In addition, the sequence maintains continuous property and business access at all times during construction. This detailed and up-front planning allows our Team the confidence that the Project will be delivered on-time, in a safe manner and with limited public impacts.

For each of the construction stages, we have developed area-specific temporary traffic control strategies as highlighted on Exhibits 4.5.2.1 on Page 52. The Exhibit contains a typical section for each Stage of construction along Route 7, and explains the specific features, challenges, and solutions in critical areas.

4.5 Construction of the Project

Traffic Control Details

As explained in the Sequencing of Construction section and shown on Exhibit 4.5.2.1, our Team has developed a temporary traffic control strategy that minimizes impacts to the traveling public. Upon Award, we will begin the design of the Type C, Category V TMP and will develop site-specific Temporary Traffic Control (TTC) plans. The TTC plans will detail specific elements required during construction of the Project. These plans will be developed for each stage of work to identify barrier and channelization locations, detours, temporary sign locations, PCMS devices, construction access points, temporary pavement markings, temporary drainage, areas of construction, and all other requirements per VDOT's I&IM 241.7, the *Virginia Work Area Protection Manual*, and the *Manual on Uniform Traffic Control Devices (MUTCD)*.

Our Team recognizes common shortfalls with TTC in work zones, and we are committed to avoiding these conditions with carefully designed site specific TTC plans. For example, we will ensure that barrier ends and impact attenuators are flared as far away from traffic as much as possible. We also understand the importance of avoiding abrupt lane shifts meeting only minimum lengths on high speed/high volume freeways such as Route 7. In addition, Portable Changeable Message Sign (PCMS) device locations and messages will be included in the plans. The careful design of locations meeting sight distance requirements and concise, comprehensible message design by our traffic engineers ensures that these extremely valuable devices are utilized to the maximum benefit without providing confusing or incomplete information. Business access guide signs, and signs designed for crash avoidance, will be included in the plans to minimize business impacts and maximize safety.

Lane and Ramp Closures, Detours, Restrictions, Flagging, and Lane Widths

Highlights of our Technical Proposal are as follows:

Route 7

- No planned long-term lane closures or temporary road closures with detours;
- Time of day restrictions will follow Part 2, Section 2.11.2 of the RFP. Temporary lane closures are anticipated for paving, shoulder improvements, placement of traffic barriers, delivery of materials, and bridge work;
- Temporary 20 minute maximum full stoppages on Route 7 are only expected for limited activities, such as overhead bridge and sign work;
- No flagging operations are anticipated;
- Minimum 11' wide lanes will be maintained; and
- Temporary lane shifts will be designed to meet full posted speed limit, double the minimum length required, exceeding the requirements of the RFP.

Battlefield Parkway

- The allowed 12-month detour specified in the RFP will be utilized;
- Time of day restrictions will follow Part 2, Section 2.11.2 of the RFP;
- Temporary full stoppages outside of the full closure limits are not expected;
- Flagging operations are not anticipated; and
- Minimum 11' wide lanes will be maintained where work is within limits open to traffic.

4.5 Construction of the Project

Work Zone Speed Reductions

Our Team has taken the proactive step of already completing an analysis utilizing VDOT's TE-350 to determine the appropriate posted speed limit during construction. Based on this analysis, we recommend maintaining the existing Route 7 posted speed limit of 55 mph for the reasons listed below:

- The geometry of all temporary lane shifts will be designed to meet full 55 mph criteria; and
- Speed reductions where not justified based on geometry have the potential to lead to speed differentials, increasing the likelihood of work zone crashes.

This recommendation will be fully discussed with VDOT's Traffic Engineering staff, and we understand that the final determination will be made in coordination with the District Traffic Engineer post-Award.

Unique Project Challenges and Solutions

Specific consideration and attention has been given to the unique challenges of the Project, with focus on mitigation and communication strategies that maximize public safety, minimize impacts to the traveling public, and minimize schedule risk. By carefully studying the Project and its construction challenges, our Team has determined which elements of the Project mandate special consideration, and have devised the following unique solutions to mitigate impacts:

1. Detour Design and Implementation

As allowed by the RFP, our Team will utilize a full closure and detour of Battlefield Parkway during construction. This will allow the construction of the grade change and bridge over Route 7 to be efficiently constructed in a manner that safely separates construction activities from public traffic.

Prior to implementing the detour, our Team will perform a complete traffic analysis and construct the off-site intersection improvements recommended in the RFP. In addition we will implement our approved ATC #01, which avoids the replacement of the existing signal pole in the southeast quadrant of the intersection of Battlefield Parkway and Fort Evans Road. This ATC **exceeds the RFP** plan safety and construction impacts, allowing the existing mast arm pole that is intertwined with overhead utility wires to remain in place. To accommodate the additional left turn lane from southbound Battlefield Parkway to Fort Evans Road, we will install a pedestal signal pole meeting VDOT and Town of Leesburg requirements. Using this pedestal pole eliminates impacts to pedestrian traffic and **eliminates traffic stoppages for overhead mast arm removal and installation otherwise required with the RFP design.**

In addition to this intersection, a second northbound left turn lane will also be added to the intersection of River Creek Parkway and Riverside Parkway. Recognizing that both of these permanent improvements will provide immediate relief to the traveling public, **our Team commits to exceeding the RFP requirements by opening the additional lanes at both of these intersections January 15, 2020, earlier than required for the start of the Battlefield Parkway detour. This represents our Team's Unique Milestone #1.** We will also adjust signal times both upon opening of the additional lanes and again upon detour implementation to ensure that the timings are optimized at all times.

2. Detour Monitoring

Even with the completion of the thorough detour traffic analysis included with the RFP documents, driver route choice is simply an educated prediction, given the several possible alternate routes. Understanding that this prediction on driver route choice and detour volumes has a high degree of uncertainty, the Shirley Team commits to **exceeding the RFP requirements** by re-counting traffic shortly after detour implementation, re-analyzing operations, and adjusting signal timings as necessary to optimize the flow of traffic.

4.5 Construction of the Project

Furthermore, we commit to **exceeding the RFP requirements** by having our Lead Maintenance of Traffic Engineer review the detour and associated temporary traffic control monthly during the detour, providing recommendations for safety and operational adjustments utilizing his expertise as a Professional Traffic Operations Engineer (PTOE).

3. Work Zone Communications & Outreach

The high traffic volumes traveling through the Route 7 corridor combined with the local residential communities, businesses, and churches highlight the need for enhanced public communications during construction. For through traffic, notification of work zone traffic conditions on Route 7 (including lane restrictions and new travel patterns) is critical to maximizing safety. For local stakeholders utilizing intersecting streets and driveways, thorough advance and on-site communication for access shifts or changes to access points is essential. Our Team commits to the following additional work zone public communication strategies:



Figure 4.5.2.1 - Example of Static Warning Sign

- Posting special static warning signs with flashing warning signs along Battlefield Parkway prior to the road closure, such as we did on our Sycolin Road Overpass project in the Town of Leesburg, as depicted in Figure 4.5.2.1, **exceeding the requirements of the Work Area Protection Manual**.
- Holding “Pardon Our Dust” public meetings minimally on a semi-annual basis, instead of only prior to major phases on construction, **resulting in more opportunities for public interaction and Q+A with the construction and design team**.
- Holding special first responder meetings with fire, rescue, and police services prior to traffic switches, ensuring that response times for emergency personnel are not inhibited.
- Creating public friendly detour maps, such as we did on our Sycolin Road Overpass project, as depicted in Figure 4.5.2.2.

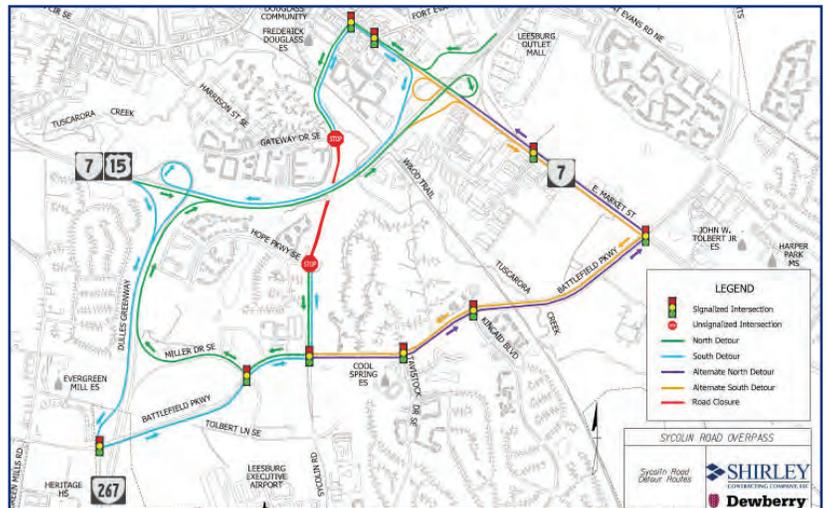


Figure 4.5.2.2 - Example Public Detour Map from Sycolin Road Project

4. Minimizing Impacts Through Design

The Team has designed the roadway and bridge structure with specific considerations to reduce impacts to the public. These include:

- Utilizing a roadway profile that minimizes imported fill material, reducing truck trips;
- Utilizing a bridge design and construction approach that does not require installation of piles within the existing roadway prior to the implementation of the road closure; and
- Utilization of a roadway design that avoids pavement overlay within the Battlefield Parkway intersections with Russell Branch Parkway (south end) and the shopping center (north end), eliminating safety and operations impacts to public traffic within these intersections.

4.5 Construction of the Project

5. Enhanced Safety Devices

In addition to installing these enhancements on the existing roadway prior to construction, the following safety enhancements will be utilized throughout construction:

- The use of **tighter than required channelizing device spacing** for increased work zone delineation and construction personnel safety;
- Use of **lane shifts a full 2X longer than the required minimum shift length on Route 7**, to avoid “abrupt” shifts for the high volume traffic. Use of this “forgiving geometry” is expected to reduce potential side-swipe and run-off-road crashes;
- Use of **wider than required lane lines** for increased delineation of lane shifts;
- Use of new **Portable Temporary Rumble Strips** during flagging operations, which are proven to heighten driver awareness and reduce collisions. These devices are currently recommended, but not mandatory for design-build projects until mid-2019 advertisements; and
- Nighttime visibility enhancements. Our Team recognizes the challenges of nighttime visibility in the work area once lanes are shifted, given that VDOT criteria does not require high visibility pavement markings, and allows the removal of the existing raised pavement markers (reflectors) outside the limits of the shift tapers. This combination of these two conditions can lead to very poor delineation of lanes at night and in wet roadway conditions, as shown in Figure 4.5.2.3 below along I-66 in Manassas. In an effort specifically focused on crash reduction, our Team commits to the following two enhancements:
 - Use of wet reflective temporary tape pavement markings for all lane shifts on Route 7, which are only required to be paint per RFP requirements. These markings, shown in Figure 4.5.2.3 increase lane shift visibility, especially at night and during wet pavement conditions and have proven to reduce crashes by 10-25%; and
 - The use of full continuous temporary Raised Pavement Markers (RPMs) with installation of all temporary markings for increased lane alignment visibility, especially at night and during wet pavement conditions (only required at lane shifts per the Work Area Protection Manual).



Figure 4.5.2.3 - 1. Work Zone without wet reflective markings or RPM



2. RPM reflectors enhance lane lines



3. Wet reflective markings providing superior visibility

Project Stakeholders

Our Team recognizes that proactive communication with all project stakeholders is essential. As with any large scale transportation project, some inconvenience is unavoidable, but our Team’s goal is to minimize these impacts. We have proactively identified project stakeholders, and have developed specific innovative communication and mitigation strategies that exceed project requirements. These include our commitment to use additional PCMS for motorist guidance, committing to hold additional “Pardon our Dust” meetings, and utilizing enhanced safety devices. The stakeholders, their potential impacts, and our planned communication and mitigation strategies are detailed in Table 9 on the following page.

4.5 Construction of the Project

Table 9 Planned Stakeholder Communications and Mitigation Strategies

Stakeholders	Impacts	Communication/Mitigation Strategies
Traveling Public	Additional travel time for detoured traffic Potential safety impacts	<ul style="list-style-type: none"> • Hold a minimum of 3 “Pardon Our Dust” meetings for the general public, public safety officials, and other stakeholders throughout design and construction, especially prior to implementing major traffic pattern switches • Special detour route maps for public distribution • All Route 7 widening operations behind barrier • PCMS Signs will be utilized for public notices • Will provide VDOT with content for social media • This outreach can include media blitzes, postings, mailing, and special sign installations
Local Businesses with Route 7 Access	Potential confusion for access	<ul style="list-style-type: none"> • PCMS Signs will be utilized for public notices • Enhanced signing for new access roads • Direct coordination with businesses
Schools <i>Loudoun County Public Schools: John W. Tolbert E.S., Cool Spring E.S., Harper Park M.S., Heritage H.S.</i>	Potential delays to school buses/Transportation Services	<ul style="list-style-type: none"> • Coordination of construction activities directly with school staff; • No lane closures during school bus operating hours when possible (except for Battlefield Pkwy closure); • Advance notification of traffic pattern changes to School Transportation staff
Police, Fire & Rescue <i>Leesburg Police, Loudoun County Sheriff, Loudoun County Fire, Rescue, EMS</i>	Potential response time impact, especially during Battlefield Pkwy closure	<ul style="list-style-type: none"> • Advance notification of temporary lane restrictions and changes to traffic patterns; • Representatives will be notified of approved lane closure requests; • Pre-switch emergency responder meetings for response planning
Loudoun County Transit	Re-routing of Bus Route 57 (Village at Leesburg), which utilizes Battlefield	<ul style="list-style-type: none"> • Work with Loudoun County Transit to identify route and bus stop relocations • Special posters and notifications for transit users will be installed prior to re-routing
Potomac Station & Leesburg Corner Premium Outlets	Potential confusion in access routes	<ul style="list-style-type: none"> • Access to and Signing for Potomac Station and Leesburg Corner Premium Outlets maintained at all times • Notifications of traffic switches to be sent to mall management
Cardinal Park Drive Businesses	Potential confusion for access once signal is removed	<ul style="list-style-type: none"> • Posting of PCMS signs prior to traffic switch • Installation of post-mounted guide signs for access route from Cardinal Park Drive to/from Route 7
Adjacent Projects <i>Leegate</i>	Possible conflicting construction operations	<ul style="list-style-type: none"> • Utilization of a liaison to coordinate construction activities and • Avoid conflicts • Bi-weekly coordination meetings

4.6 Proposal Schedule



4.6 Proposal Schedule

4.6.1 Proposal Schedule

The Shirley Team’s Proposal Schedule is provided in Volume II.

4.6.2 Proposal Schedule Narrative

Our Team has reviewed the Project and schedule requirements of the Request for Proposals (RFP) in detail and developed a Proposal Schedule outlining our plan to successfully manage all phases of the Project. This schedule has been optimized to deliver the Project in the shortest time possible while meeting RFP requirements, minimizing impacts to stakeholders, protecting the environment, and ensuring the safety of motorists and workers. Our Team plans to execute and deliver this Project by the November 30, 2021 Final Completion Date. As added benefits, we commit to **Unique Milestone #1** to complete the off-site intersection improvements by January 15, 2020, **Unique Milestone #2** to open the proposed West Driveway by June 23, 2020, and **Unique Milestone #3** to open the proposed Keystone Drive by August 27, 2020. Each of these milestones will provide the public with substantial congestion relief earlier than the implementation of the detour.

A summary of the Contract and Schedule Milestones are Shown in Table 10.

Table 10: Contract and Schedule Milestones

MILESTONE	DATE
Notice of Intent to Award	December 20, 2018
CTB Approval / Notice to Award	January 10, 2019
Design-Build Contract Execution	February 20, 2019
Notice to Proceed	February 22, 2019
Unique Milestone #1 – Detour Intersection Improvements	January 15, 2020
Unique Milestone #2 – Open West Driveway	June 23, 2020
Unique Milestone #3 – Open Keystone Drive	August 27, 2020
Start Battlefield Parkway Closure / Detour	July 18, 2020
End Battlefield Parkway Closure / Detour	July 18, 2021
Burn in Period for New Intersection / Signal	July 19 to September 16, 2021
Substantial Completion	October 1, 2021
Final Completion	November 30, 2021

Work Breakdown Structure

Our Team has developed a detailed Proposal Schedule in accordance with the RFP requirements. The schedule is organized into a hierarchal Work Breakdown Structure (WBS) to demonstrate the relationships and activity durations amongst the milestones, Scope Validation Period, design, public involvement/public relations, environmental permitting, ROW acquisitions, utility relocations, construction, and Project Management disciplines. All elements of the design-build process captured under the Level I tasks and are described below:

- A. Milestones:** Area reserved for easy review of the Project status. This contains major milestones that are critical to the Project or prescriptive in RFP. This section contains a second level WBS to include Project Management activities including Scope Validation Period and other submittals to be prepared by the Project Management team including the baseline schedule.

4.6 Proposal Schedule

- B. Design:** Includes preliminary engineering services, plan development, QA/QC reviews, submittal milestones, and reviews by VDOT, Town of Leesburg and other regulatory agencies, and approvals of plans. This section of the schedule includes a second level WBS structure to group design activities by type of design submission including advanced plan packages for right-of-way and structural elements, roadway and traffic management plans, bridges and retaining walls, and water and sewer relocations, QA/QC, and Health and Safety Plans specific to the Project.
- C. Environmental Permitting:** Includes wetland and stream delineations and jurisdictional determination, permit management and preparation, mitigation, and permit submissions, reviews and approvals. Initial efforts will focus on the Corps of Engineers Individual Permit, Virginia Water Protection Individual Permit and LD 455/VPDES Permit and the SWPPP submission. This section also includes activities for any noise studies that are required post award as well as site assessments and mitigation plans for hazardous materials if needed.
- D. Public Involvement:** This section of the schedule allows for monthly planned public involvement meetings and updates to the Office of Public Affairs for major traffic shifts and the VDOT website.
- E. Right-of-way Acquisition:** This section of the schedule is used to monitor the acquisition of right-of-way and easements for the Project including title searches, appraisals and appraisal reviews, offers, negotiations, and settlements. To prioritize groups of properties by order of need, we have included a second level WBS structure that includes separate right-of-way acquisition activities by Stage. Dividing the right-of-way activities into groups of parcels will enable our Team to focus our right-of-way acquisition efforts on the most schedule critical acquisitions and track these critical acquisitions to ensure on-time completion.
- F. Utility Relocations:** The utility relocation section of the schedule includes activities for UFI meetings, preparation of preliminary engineering (PE) plans and estimates, approval of PE plans and estimates, final utility relocation design by the utility owner and utility relocation construction. The utility relocations are separated into second level WBS groups by utility owner.
- G. Construction:** Includes all construction components of roadway, bridge, retaining walls, and culverts as well as TTC, construction access, signage, signals, lighting and drainage. The Construction section of the schedule is segmented by additional levels of WBS structure to divide the construction activities into groups of work packages that can be easily tracked to ensure on-time completion of the Project.

Below is a complete outline of the WBS Structure for the Project:

Table 11: WBS Structure

WBS Path	WBS Name
2018-JRA321	Route 7 and Battlefield Parkway Interchange
2018-JRA321.A	Milestones
2018-JRA321.A.1	Project Management
2018-JRA321.B	Design
2018-JRA321.B.1	Advanced Bridge Plan Set
2018-JRA321.B.2	ROW Plan Set
2018-JRA321.B.3	Roadway / TTC Plans
2018-JRA321.B.4	Final Bridge Design Plans
2018-JRA321.B.5	Water and Sewer Plans
2018-JRA321.C	Environmental Permitting
2018-JRA321.C.1	Noise Mitigation
2018-JRA321.C.2	SWPPP/LD-445
2018-JRA321.C.3	Joint Permit Application

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WBS Path	WBS Name
2018-JRA321.C.4	Hazardous Materials
2018-JRA321.D	Public Involvement
2018-JRA321.E	Right-of-Way
2018-JRA321.E.1	ROW / Easement Acquisitions Stage 2A
2018-JRA321.E.2	ROW / Easement Acquisitions Stage 2B
2018-JRA321.F	Utility Relocation
2018-JRA321.F.1	Electric
2018-JRA321.F.1.1	Dominion Power
2018-JRA321.F.2	Communication
2018-JRA321.F.2.1	Verizon
2018-JRA321.F.2.2	Comcast
2018-JRA321.F.2.3	CenturyLink
2018-JRA321.F.2.4	Summit IG
2018-JRA321.F.3	Gas
2018-JRA321.F.3.1	Washington Gas
2018-JRA321.F.4	Water
2018-JRA321.F.5	Sewer
2018-JRA321.G	Construction
2018-JRA321.G.2	Stage 1
2018-JRA321.G.2.1	Route 7 EB Lanes
2018-JRA321.G.2.2	Route 7 WB Lanes
2018-JRA321.G.1	Stage 2A
2018-JRA321.G.1.11	Route 7 EB Lanes
2018-JRA321.G.1.2	Route 7 WB Lanes
2018-JRA321.G.1.3	Battlefield South
2018-JRA321.G.1.4	Battlefield North
2018-JRA321.G.1.5	Ramp A
2018-JRA321.G.1.6	Ramp B
2018-JRA321.G.1.8	Ramp D
2018-JRA321.G.1.9	West Driveway
2018-JRA321.G.1.10	Keystone Drive
2018-JRA321.G.3	Stage 2B
2018-JRA321.G.3.1	Route 7
2018-JRA321.G.3.1.1	Ramp A
2018-JRA321.G.3.1.2	Ramp B
2018-JRA321.G.3.1.3	Ramp C
2018-JRA321.G.3.1.4	Ramp D
2018-JRA321.G.3.2	Battlefield South
2018-JRA321.G.3.3	Battlefield North
2018-JRA321.G.4	Battlefield Parkway Bridge over Route 7
2018-JRA321.G.4.1	Battlefield Parkway Detour Construction
2018-JRA321.G.4.2	Substructure
2018-JRA321.G.4.2.1	Abutment A

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WBS Path	WBS Name
2018-JRA321.G.4.2.2	Pier 1
2018-JRA321.G.4.2.3	Abutment B
2018-JRA321.G.4.3	Superstructure
2018-JRA321.G.4.3.1	Structural Steel
2018-JRA321.G.4.3.2	Bridge Deck
2018-JRA321.G.4.3.3	Sidewalks
2018-JRA321.G.4.4	North Approach
2018-JRA321.G.4.5	South Approach
2018-JRA321.G.5	Stage 3
2018-JRA321.G.5.1	Roadway
2018-JRA321.G.5.1.1	Route 7
2018-JRA321.G.5.1.2	Battlefield Parkway
2018-JRA321.G.5.1.3	Surface Pave / Striping
2018-JRA321.G.5.2	SWM Ponds / Gradework

Calendars

The following is a description of the calendars used for the Project Schedule:

Global Calendar – All calendars are based on 8-hour work days and include the following holidays:

- New Years Day
- Memorial Day
- Independence Day
- Labor Day Holiday
- Thanksgiving Day
- Christmas Day

Calendar 01 - “5 DAY WORK WEEK WITH HOLIDAYS” – this calendar is based on five working days per week and is used for most design, administrative, and construction activities that are less affected by weather.

Calendar 02 – “7 DAY WORK WEEK” – Assigned to activities that have durations based on calendar days instead of work days. For example, VDOT’s 21 calendar day review duration.

Calendar 03 – “WINTER RESTRICTED” – This calendar is based on working part-time or with reduced production from late November to late March with less work days in January and February. This calendar is assigned to activities that are anticipated to have reduced productivity and more weather restrictions during the winter months.

Calendar 04 – “WINTER SHUTDOWN” – Assigned to activities that are anticipated to be shut down during the winter, such as asphalt surface paving, pavement markings and bridge deck pours. This calendar contains no working days from December 25 one year to March 15 of the next year.

Schedule Sequence

Plan to Accomplish the Work/Means and Methods

The narrative below describes our Team’s overall plan and sequence of operations grouped by the Level I WBS Project disciplines. These include design, public involvement, environmental permitting, ROW acquisition, utility relocation, and construction. The activity sequence was developed to most efficiently utilize available

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resources and to complete the Project in the minimum amount of time. The sequencing was developed by considering the construction phasing of operations and determining the longest path to completion with all factors examined including manpower, subcontractors, materials, design, environmental constraints, and most importantly public safety of the workforce.

Design Phase

The design phase includes plan preparation, design quality assurance/quality control reviews, and submission of ROW, roadway, TTC, drainage and bridge plans at multiple stages of the design process with a 21 calendar day activity for VDOT reviews after each submission. The design phase also includes activities for the completion of surveys, utility designations, test pits and utility relocation plans, the Scope Validation Period, and geotechnical investigations, including time for VDOT's review of the geotechnical report prior to submission of the final roadway and bridge plans. Our Team will begin the design phase of the Project immediately upon Notice to Proceed (NTP) to get an early start on surveying and mapping, geotechnical investigations, utility designations, environmental studies, right-of-way plans, and utility relocation plans. Our Team will prepare advanced plan sets for ROW acquisitions, retaining walls and bridge substructure, as early as possible to mitigate any potential schedule delays. Once the advanced plan set for ROW is approved, work to acquire necessary ROW and Easements will begin immediately. Our Team will continue to advance roadway, drainage (including storm water management items), TTC, structural elements and all other design items for final approval by VDOT. The schedule anticipates final approval of all plans by November 2019.

Environmental Permitting

Environmental Permitting will begin upon NTP with the completion of wetland delineations, stream assessments, and jurisdictional determinations. Once the design has progressed to a point where full impacts are known, our Team will advance the submittals for the Joint Wetlands and Waters Permit Application, LD 445 / VPDES Permits and finalize the noise analysis to verify the RFP determinations. If necessary, we will also develop hazardous material management plans and continue environmental site assessments. At this time, we do not anticipate any additional site assessments will be required. We are scheduled to have all environmental studies and permitting completed by Fall of 2019.

Public Involvement

Our public outreach efforts include submitting our Emergency Contact List and Community Stakeholder Coordination plan after NTP, holding Stakeholder Information Meetings during the design phase, public information "Pardon our Dust" meetings at the start of major construction activities and/or prior to major traffic switches, providing updates to the Office of Public Affairs, and additional specific group meetings as necessary. There are many other public involvement activities that our Team will perform, including meeting with local businesses and affected property owners, attending meetings with Homeowners Associations, local government representatives, and community groups.

Right-of-Way Acquisition

The acquisition of right-of-way and easements will start upon submission of the advanced ROW Plans with title searches for the affected properties. We will prepare advanced acquisition plans to expedite the start of appraisals and procurement of right-of-way or easement acquisitions on the most critical properties. To effectively prioritize and track the status of these acquisitions, we have separated the Project into two groups and included a detailed schedule of right-of-way acquisition activities for each group of properties. These activities include title searches, preparation of fair market value appraisals, appraisal reviews by the

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independent review appraiser, VDOT review and approval of the appraisals, preparation and delivery of offers to the affected property owners, negotiations with the property owners, signed options or filing of certificates if necessary, preparation of final plats, and final settlements.

Utility Relocations

This section in the schedule is used to track the entire utility relocation process and is broken down by utility type and utility owner. All coordination efforts with the utility owners as well as the utility relocation activities are then tied to the construction activities that will be affected by the required utility relocation.

Within each utility owner or group, we have also included activities for holding the Utility Field Investigation (UFI) meeting, followed by preparation of the Preliminary Engineering (PE) estimates and plans by the utility owner, approval of the PE estimates and plans, final design and approval of the utility relocation plans, and construction of the relocation by area. Although we have already met with each individual utility company to discuss the proposed relocations and prior rights, the utility relocation schedule starts with formal UFI meetings in May 2019 following completion of all utility test pits and first submission of Roadway Plans. This will enable our Team to confirm the utility conflicts based on the field test pit data and ensure that required easements are accurately shown on the Roadway Plans prior to holding the formal UFI meeting. We will continue this early coordination of utilities throughout the Design Phase to ensure that the Roadway Plans are well coordinated with the utility relocation plans. Below is a brief summary of the utilities detailed in the Proposal Schedule:

Waterlines - It is anticipated that the existing 8” waterline located along EB Route 7 between approximate stations 1028 and 1062 will be abandoned prior to the start of any major construction activities in December 2019. In addition, during the design process, we will identify other potential conflicts with existing waterlines, services, and fire hydrants. We anticipate that portions of the existing 8” waterline that is to remain in service along EB Route 7 may have to be relocated to accommodate the roadway widening work. We have also identified the potential for a waterline relocation at the proposed intersection of Keystone Drive and Potomac Station, and have included this in our plan. Design for waterline relocations will be coordinated with the roadway design and the water line relocation work is scheduled as soon as easements are acquired.

Sanitary Sewer - Two existing sanitary sewer crossings have been included in our schedule to replace existing sewer crossings which will conflict with the proposed construction. The first, crossing Route 7, will be installed utilizing trenchless technology to minimize impacts to the traveling public and allow the installation of casing pipe under Route 7 without impacting roadway activities above. The sanitary sewer work on Route 7 is scheduled to start in Spring 2020 in order to have the new sewer installed prior to the construction of the new interchange ramps which conflict with existing sanitary sewer manholes. The second sanitary sewer, crossing Battlefield Parkway, will be installed by open cut methods and will occur prior to the detour so as not to interfere with the interchange construction schedule.

Verizon - Verizon has several facilities that are located along the corridor that will be in conflict with the proposed work. The main conflict is with the existing overhead lines running on Route 7 EB the length of the project. The area between the west end and Battlefield Parkway will remain overhead and will be relocated onto a new pole line to be installed by Dominion Power. In conjunction with the overhead lines, there are some underground facilities in this corridor which may be in conflict with proposed drainage and roadway widening work. The overhead lines from Battlefield Parkway to the east end are to be relocated by others into an existing ductbank, no later than December 2, 2019 prior to the start of any major construction

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activities. The remaining lines will be relocated after new easements are acquired. Finally, we anticipate a minor relocation of existing lines to be required at the intersection of Keystone Drive and Potomac Station to accommodate that work.

Comcast - Similar to Verizon, we have identified conflicts between the existing overhead facility along EB Route 7 through the entire Project limits. The existing overhead lines from Battlefield Parkway to the east are to be relocated by others into an existing ductbank no later than December 2, 2019 prior to the start of major construction activities. The remaining overhead lines from the west end to Battlefield Parkway will be relocated to the new Dominion Power pole line immediately following Verizon's relocation.

CenturyLink - CenturyLink has existing facilities within the Project limits that may be in conflict with the work. We will prioritize test pitting of this utility during the design phase to determine the extent of the conflicts, if any. We will then work closely with CenturyLink to design and relocate any facilities that are in conflict but do not anticipate this to impact the overall schedule or critical path.

Summit IG - Along WB Route 7, Summit IG has an existing multi-conduit ductbank that will be relocated into a new ductbank. This new ductbank will be designed to fit within the new interchange and associated ramps and will be located within the VDOT ROW or utility easement. In order to expedite construction, our Team will likely install all or a portion of the new ductbank so that this can be coordinated with other Project activities.

Dominion Power Overhead Lines - The existing overhead line on EB Route 7 between the west end and Battlefield Parkway will be in conflict with the proposed widening and ramp work. In addition, we have identified minor conflicts with existing underground lines on Route 7 and at Keystone Drive. We will work closely with Dominion Power to ensure all conflicts are resolved in accordance with our Proposal Schedule time frames. Finally, we will work with Dominion Power to design and install a new power service which will be required for the new signal at the interchange.

Washington Gas - There is an existing Washington Gas line located in the median of Route 7 for the length of the Project. It is our intent to prioritize test pitting of this facility and design all construction elements to avoid conflicts, other than several minor issues that will likely be unavoidable.

Construction

Our construction sequence is organized into three major Stages which are directly coordinated with the pre-construction activities, right-of-way acquisitions and utility relocations, while maximizing opportunities for concurrency, as highlighted in Figure 4.5.1.1. Each Stage is subdivided into geographical areas to include Route 7, Battlefield Parkway, interchange ramps, the bridge structure, and other major components. From the beginning, we have structured our construction sequence to account for the 12-month limitation of the Battlefield Parkway detour. Our sequence of construction is outlined as follows:

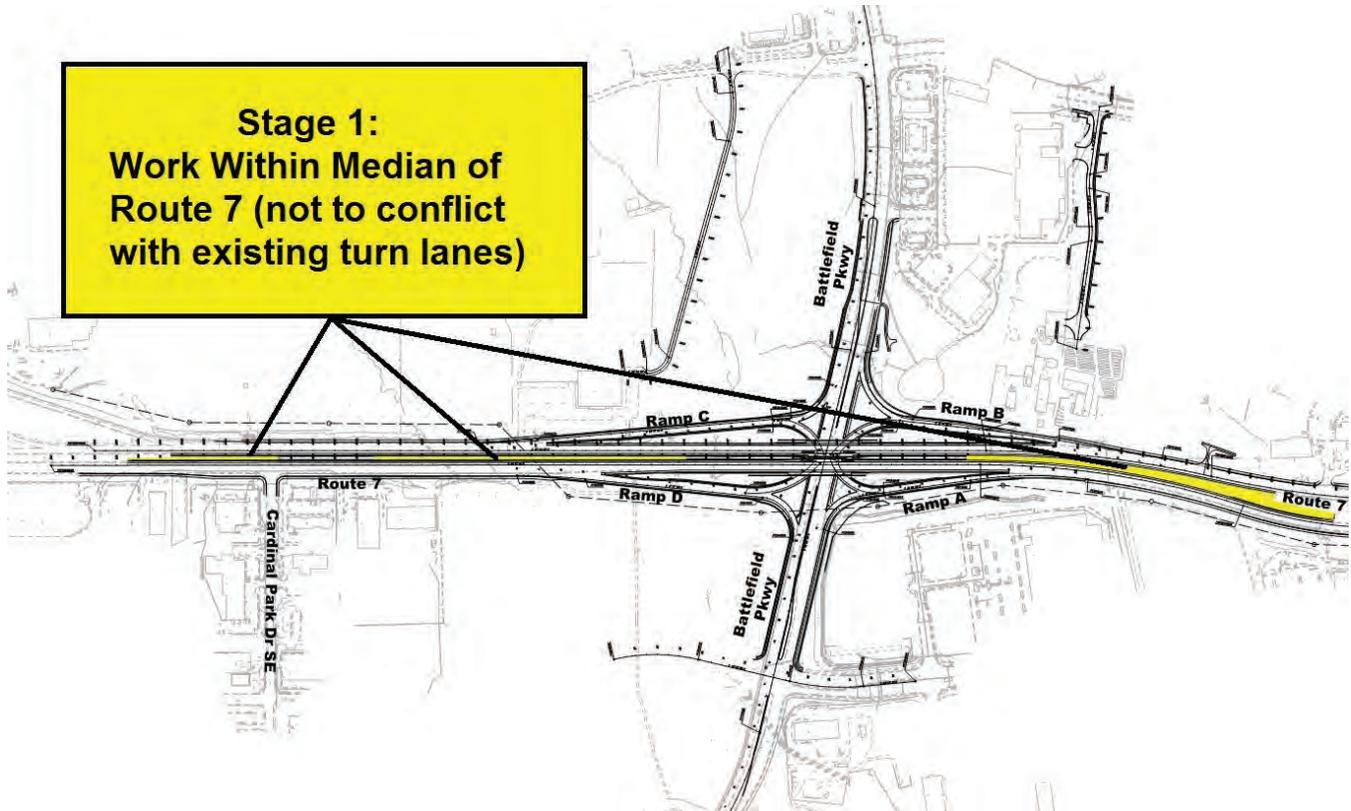
Stage 1 - Fall 2019 to Spring 2020

Construction in Stage 1 will focus on work that can be performed concurrent with the ROW and easement acquisition process, and utility relocations, thus maximizing the overall construction duration. Stage 1 work will primarily be performed in the Route 7 median and consist of:

- Installation of initial TTC and E&S Controls;

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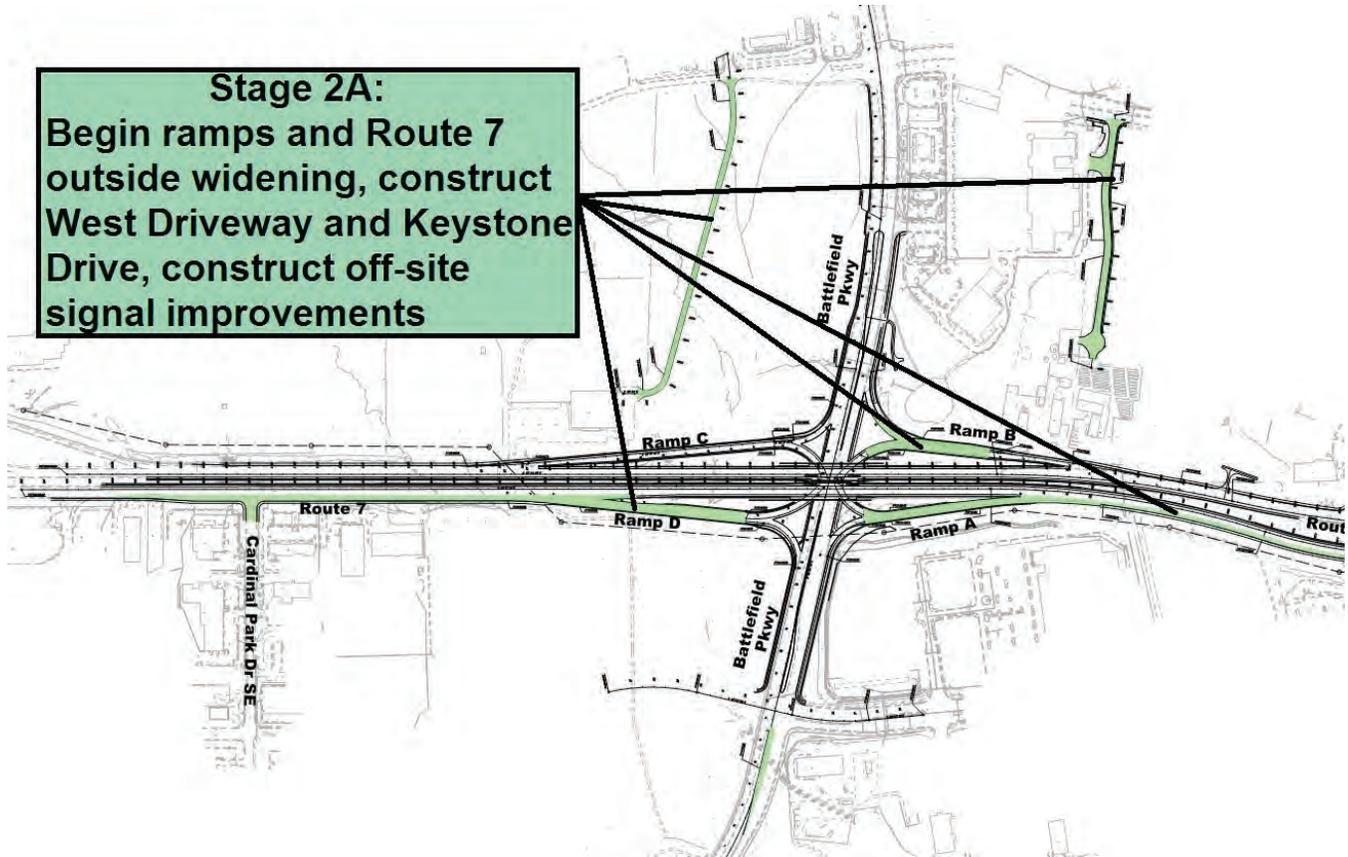
- Excavation & rough grading;
- Installation of new storm drainage; and
- Preparation work for utility relocations to be completed in subsequent Stages.



Stage 2A - Spring 2020 to Spring 2021

As ROW is obtained, work in Stage 2A will focus on activities that can be completed prior to the start of the Battlefield Parkway detour period. These include:

- Clearing and grubbing;
- Installation of E&S Controls;
- Utility relocations to the outside of both Route 7 and Battlefield Parkway;
- Construction of West Driveway and Keystone Drive;
- Improvements to the off-site intersections required for the Battlefield Parkway detour;
- Retaining walls and embankment fills for ramp construction;
- Ramp construction not in conflict with existing roadways;
- Route 7 widening at the tie-ins to the proposed interchange ramps;
- Permanent signing including new overhead sign structures; and
- Construction and modification of SWM Ponds and BMP's.

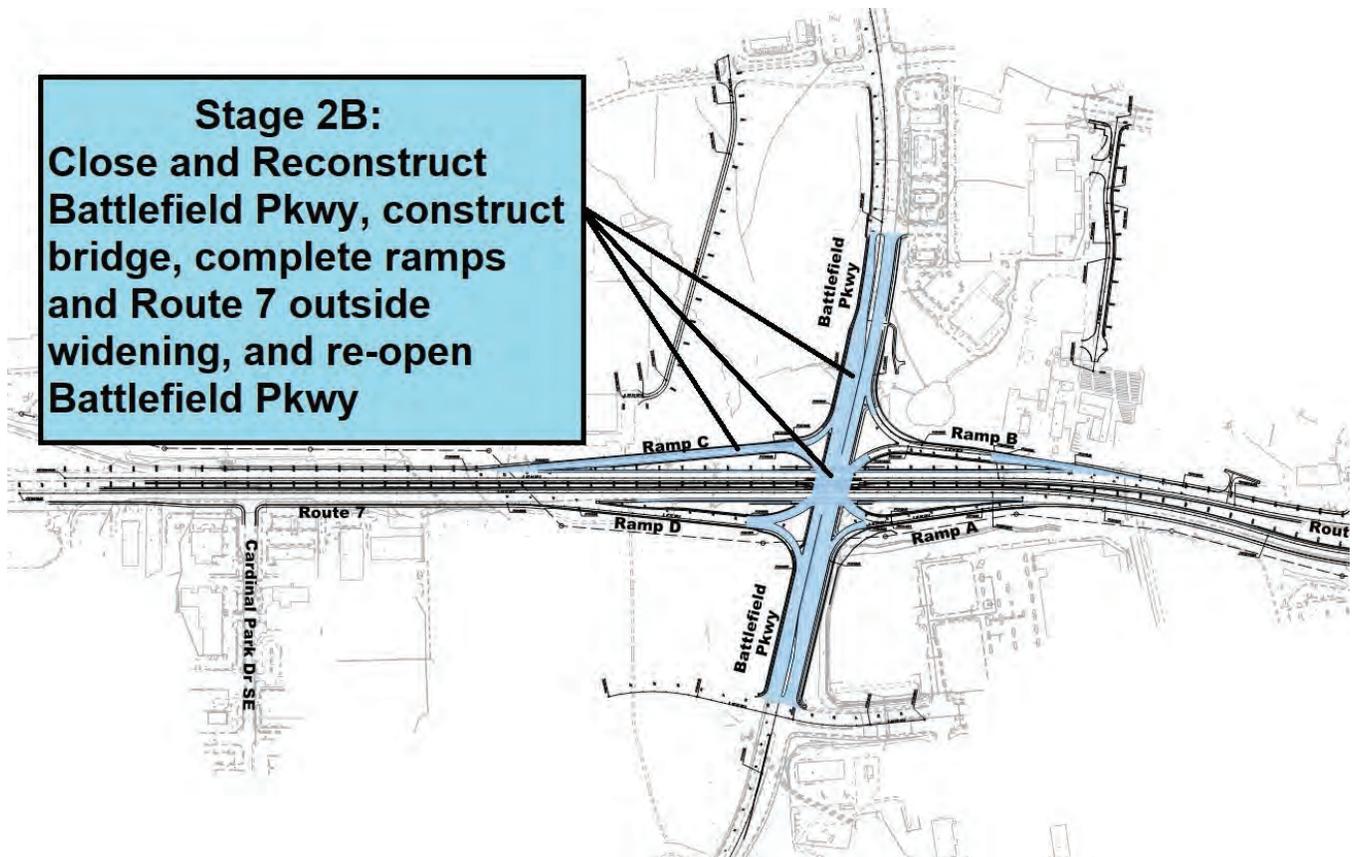


Stage 2B - Summer 2020 to Summer 2021

Stage 2B begins and ends with the implementation of the Battlefield Parkway closure and detour. Construction will focus on all work to construct the proposed bridge structure, roadway approaches and interchange ramps for the new interchange within the 12-month allowable timeframe. This work will include:

- Close Battlefield Parkway at Route 7 and implement the detour;
- Remove the existing signal at Route 7/Battlefield Parkway;
- Demolition of the existing Battlefield Parkway pavement;
- Placement of new embankment, storm sewer, and pavement structure for the Battlefield Parkway bridge approach roadway;
- Construction of bridge structure over Route 7;
- Completion of remaining ramp construction and tie-ins to the new bridge structure;
- Completion of work on Route 7 at the new bridge abutments and pier; and
- Open the new interchange to traffic and removal of the detour.

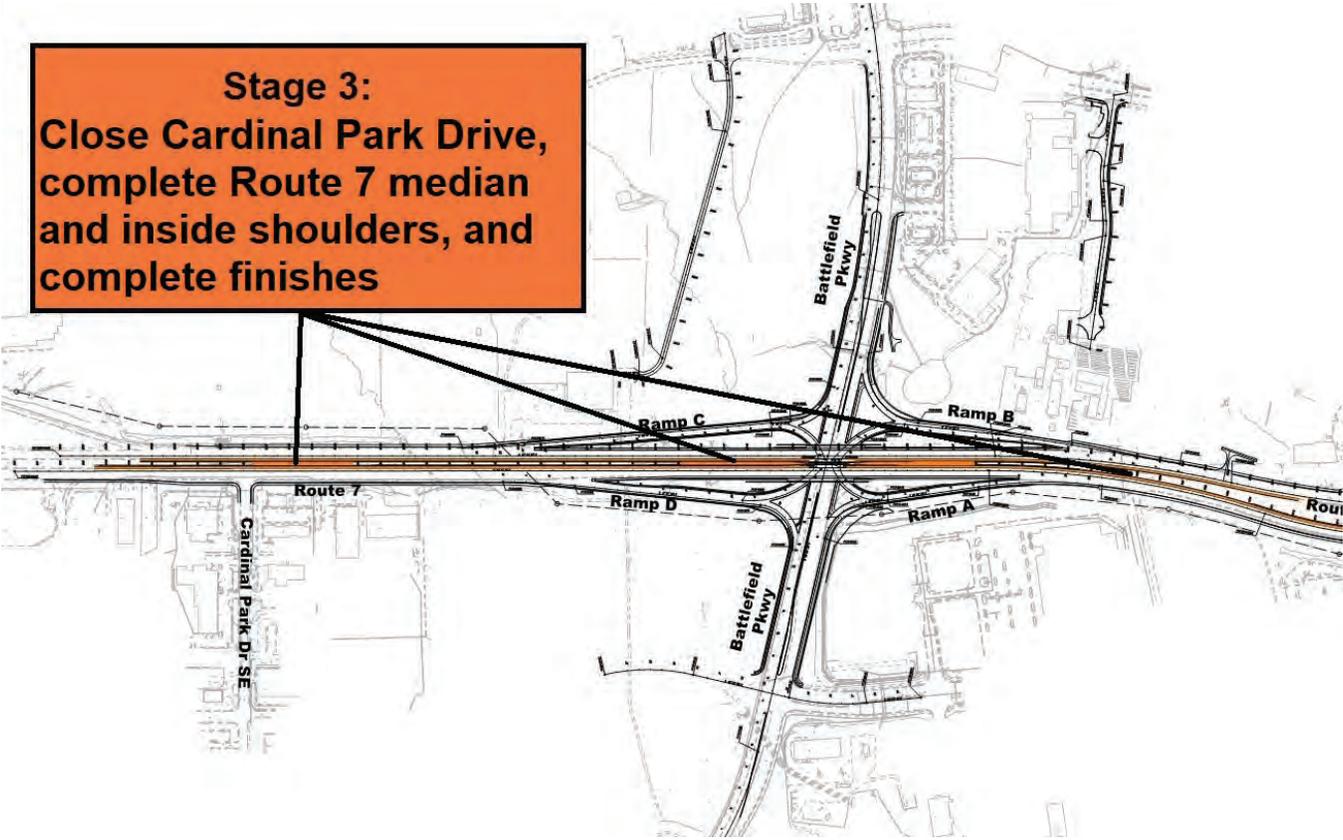
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Stage 3 - Spring 2021 to Fall 2021

Stage 3 primarily encompasses the finish activities such as surface pavement, pavement markings, signing, grading, stabilization, and completion of SWM Ponds, many of which will be pursued while the detour is in place. Construction will include:

- Permanent closure of the Route 7/Cardinal Drive intersection;
- Completion of the median work on Route 7;
- Completion of Route 7 median shoulders;
- Installation of pedestrian facilities and roadway lighting on Battlefield Parkway;
- Final surface paving and permanent pavement markings;
- Completion of SWM Ponds including access roads and fencing; and
- Final grading and stabilization.



Description and Explanation of the Critical Path

The Critical Path of our Team’s Proposal Schedule is summarized as follows:

Beginning with Project Notice to Proceed (NTP), the path runs through the Design phase to complete the survey and mapping and activities to complete the Geotechnical Data Report. Also in Design, the path includes the Final Roadway/TTC Plans and the Final Bridge Plans.

Next, as construction gets underway, the path includes the Stage 1 median work while the right-of-way is being acquired. Traffic is then shifted to begin Stage 2A, but then moves quickly to the implementation of the detour of Battlefield Parkway. The path then consists of the roadway approach pavement construction activities on both the north and south side of Route 7. Once the detour is removed, the critical path includes the finish activities and final stormwater management pond construction before achieving Substantial Completion. The Project will then complete the inspections and punchlist process before achieving Final Completion.

The Project Critical Path activities, sorted by WBS, are summarized as follows:

Activity ID	Activity Name
2018-JRA321	Route 7 and Battlefield Parkway Interchange
2018-JRA321.A	Milestones
MS-1400	Start Battlefield Parkway Detour
MS-1600	Substantial Completion
MS-1610	Final Inspections & Punchlist
MS-3000	Final Completion

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2018-JRA321.B Design

- DES-1000 Start Design
- DES-1050 Establish Survey Control / Aerial Mapping
- DES-1150 Layout for Soil Borings
- DES-1250 Complete Soil Borings for GDR
- DES-1275 Geotechnical Lab Testing
- DES-1300 Prepare / Submit GDR
- DES-1350 VDOT Review / Approve GDR
- DES-9900 Design Complete

2018-JRA321.B.3 Roadway / TTC Plans

- DES-6350 Submit FINAL Submission Plans - Roadway / TTC Set
- DES-6400 VDOT Review / Approve FINAL Roadway / TTC Set
- DES-6450 Complete Roadway / TTC Set Plans

2018-JRA321.B.4 Final Bridge Design Plans

- DES-8200 Submit FINAL Submission Plans - Final Bridge Set
- DES-8250 VDOT Review / Approve FINAL Bridge Set
- DES-8300 Complete Final Bridge Set Plans

2018-JRA321.G Construction

2018-JRA321.G.2 Stage 1

2018-JRA321.G.2.1 Route 7 EB Lanes

- ST1-12000 Install Initial TTC, Barrier, E&S Controls
- ST1-12125 Clear and Grub - Route 7 Median
- ST1-12150 Strip Topsoil - Route 7 Median
- ST1-12200 Install Drainage Pipe / Structures in Route 7 Median
- ST1-13000 Cut / Fill for EB Route 7 Median Roadway Widening

2018-JRA321.G.2.2 Route 7 WB Lanes

- ST1-15000 Install Initial TTC, Barrier, E&S Controls
- ST1-15050 Clear and Grub - Route 7 WB Lanes - Stage 1 Work
- ST1-15100 Remove Existing Guardrail / Sawcut Existing Pavement
- ST1-15300 Extend Existing Box Culvert Structures in Median Route 7
- ST1-15370 Install New Culvert Crossings Across Route 7 WB
- ST1-15520 Finish Grade / Stabilize Slopes and Ditches
- ST1-15550 Remove Temp. Barrier / Temp Stripe and Shift Traffic on Route 7 WB Lanes

2018-JRA321.G.1 Stage 2A

2018-JRA321.G.1.2 Route 7 WB Lanes

- ST2-15000 Install Temporary Barrier / MOT Devices in WB Route 7 Right Lane

2018-JRA321.G.1.3 Battlefield South

- ST2-14000 Install Initial MOT / E&S Controls - Battlefield South

2018-JRA321.G.1.4 Battlefield North

- ST2-14500 Install Initial MOT / E&S Controls - Battlefield North

2018-JRA321.G.3 Stage 2B

2018-JRA321.G.3.2 Battlefield South

- ST2-14050 Remove Existing Roadway Light Poles / Wiring - Battlefield South
- ST3-10000 Demo Pavement - Battlefield South
- ST3-10050 Install Initial E&S Controls
- ST3-10100 Clear and Grub Battlefield Parkway
- ST3-10150 Strip Topsoil / Prep for Roadway Embankment

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ST3-10200	Mass Embankment for Roadway Fill / Ramps - Battlefield South
ST3-10300	Install Drainage Structures / Pipe - Battlefield South
ST3-10350	Complete Roadway Fill / Rough Grade Sub-grade and Slopes
ST3-11400	Fine Grade / Sub-base Aggregate - Battlefield South
ST3-11450	Set Structure Tops / Pour Curb and Gutter - Battlefield South

2018-JRA321.G.3.3 Battlefield North

ST2-14550	Remove Existing Roadway Light Poles / Wiring - Battlefield North
ST3-12000	Demo Pavement - Battlefield North
ST3-12050	Install Initial E&S Controls
ST3-12100	Clear and Grub Battlefield Parkway
ST3-12150	Strip Topsoil / Prep for Roadway Embankment
ST3-12200	Mass Embankment for Roadway Fill / Ramps - Battlefield North
ST3-12300	Install Drainage Structures / Pipe - Battlefield North
ST3-12350	Complete Roadway Fill / Rough Grade Sub-grade and Slopes
ST3-12700	Fine Grade / Sub-base Aggregate - Battlefield North
ST3-12750	Set Structure Tops / Pour Curb and Gutter - Battlefield North
ST3-13150	Install Guardrail / Signage - Battlefield Parkway
ST3-13200	Finish Grade / Stabilize Slopes and Ditches

2018-JRA321.G.4 Battlefield Parkway Bridge over Route 7

2018-JRA321.G.4.1 Battlefield Parkway Detour Constr.

BR-1200	Implement Detour / Close Battlefield Parkway
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2018-JRA321.G.5 Stage 3

2018-JRA321.G.5.1 Roadway

2018-JRA321.G.5.1.2 Battlefield Parkway

ST4-12000	Install Conduit / JB for New Roadway Lighting
ST4-12050	Grade for new Concrete Sidewalk
ST4-12150	Grade / Sub-base Aggregate for Bike Trail
ST4-12200	Pave New Bike Trail
ST4-12250	DVP - Install New Roadway Lighting
ST4-12300	Finish Grade Ditches / Along Sidewalk and Bike Trail
ST4-12350	Install Remaining Signage on Battlefield Parkway
ST4-12400	Final Stabilization on Battlefield Parkway

2018-JRA321.G.5.2 SWM Ponds / Gradework

ST4-17000	Convert Ponds to Permanent Configuration
ST4-17050	Finish Grade / Pave Access Roads
ST4-17100	Install Permanent Fence / Gates around Ponds
ST4-17150	Final Grade / Stabilize Ponds

Key Scheduling Assumptions

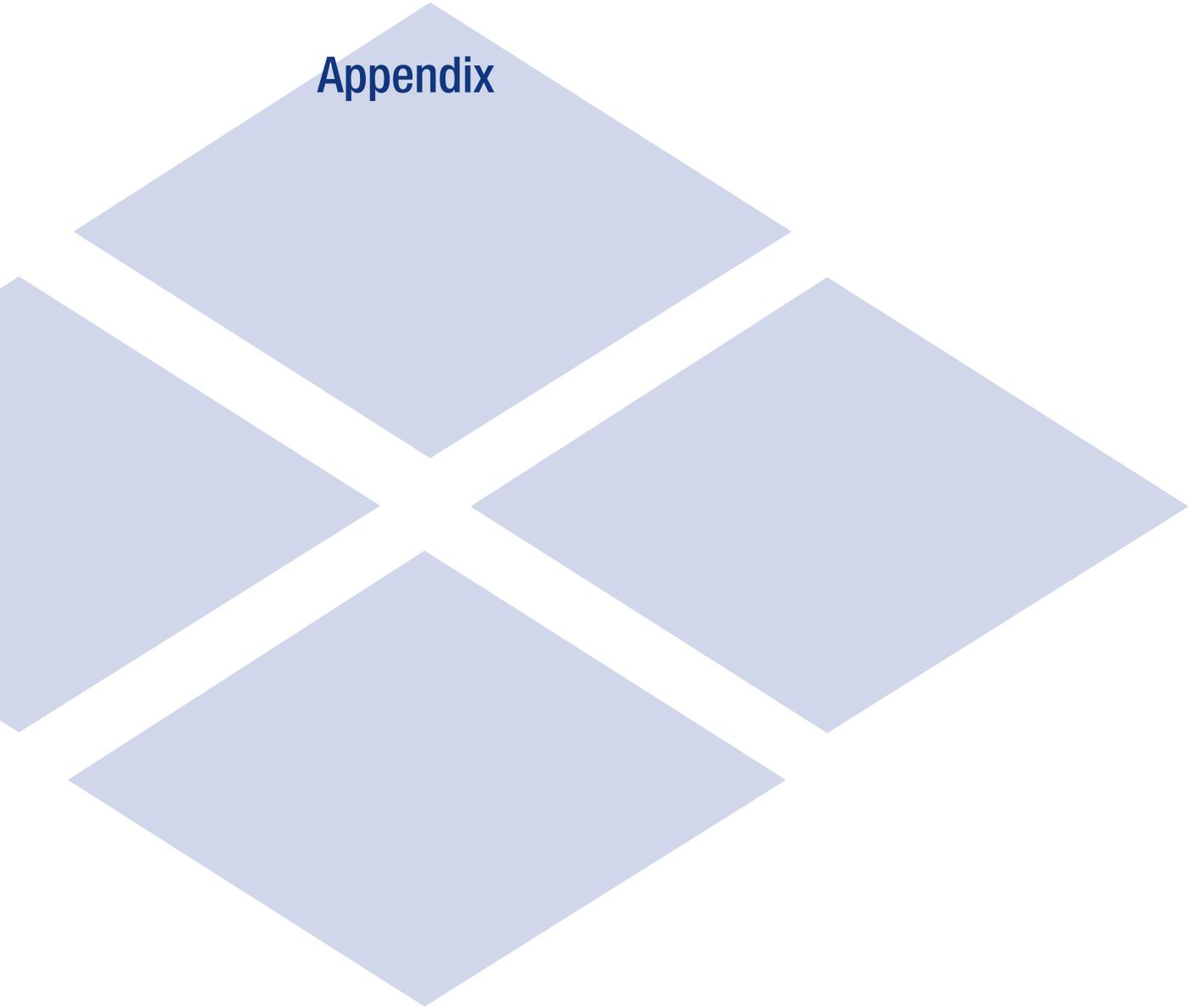
Several of the key significant assumptions relative to productivity and critical activities that our Team has made are as follows:

- Russell Branch Parkway constructed by the Leegate development will be completed in time to allow removal of Cardinal Park Drive signal and crossover at Route 7.
- Nighttime work restrictions will not be imposed.
- Existing utilities relocated and/or abandoned “By Others” will be completed no later than December 2,

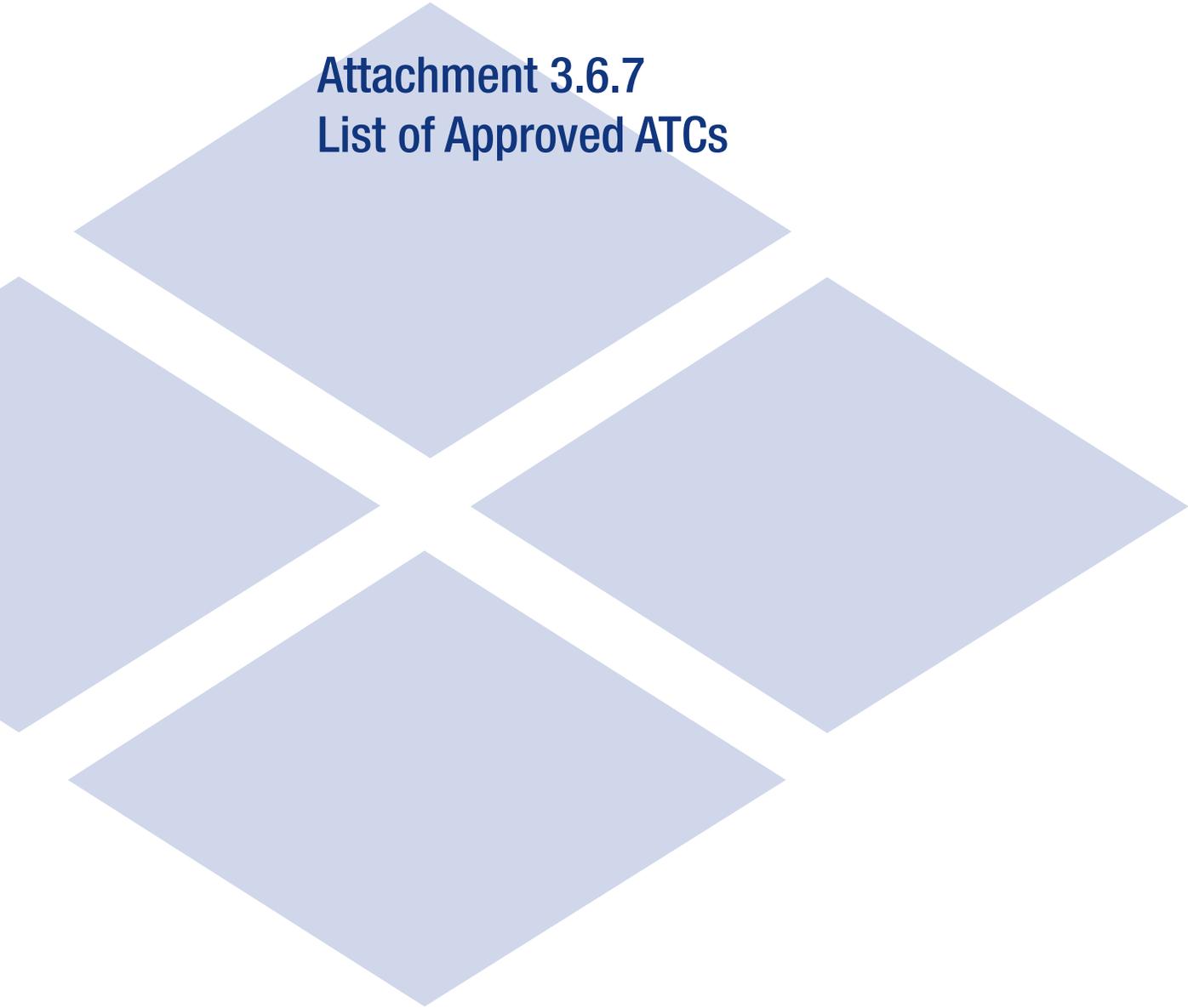
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2019, including:

- 8” Waterline to be abandoned on Route 7 EB from Station 1028 to 1062;
 - Relocation of the existing overhead Verizon utility to an underground ductbank constructed by others on Route 7 EB from Station 1049 to 1072; and
 - Relocation of the existing overhead Comcast utility to an underground ductbank constructed by others on Route 7 EB from Station 1049 to 1072.
- Environmental permitting agencies will accept VDOT’s RFP avoidance and minimization efforts taken in the RFP phase as sufficient to process permits without delay.
 - VDOT will supply adequate resources to meet the ROW schedule.
 - Utility companies will coordinate their relocations in accordance with the Project Schedule.
 - Utility companies will complete their work in accordance with the Project Schedule.
 - Crew leveling has been developed through crew-flow relationships between similar activities.
 - Crews are based on an 8-hour work day and 5-day per work week calendar.
 - There are no hazardous material, threatened & endangered species, or unforeseen environmental constraints, other than those identified in the RFP, that could delay the Project Schedule.
 - Generally, finish-to-start relationships are primarily used as much as possible to create logical flow of work in one particular area. There is some overlap between different types of activity in any one area. For example, the cut-to-fill activity in one area may be running concurrent with storm sewer installation. In this type of scenario, both will conclude with a “fine grade” activity and then the pavement section activities will begin.



Appendix



**Attachment 3.6.7
List of Approved ATCs**

ATTACHMENT 3.6.7
LIST OF APPROVED ATCs INCLUDED IN TECHNICAL PROPOSAL

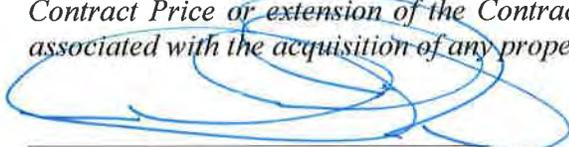
OFFEROR:

List all approved ATCs included in the Technical Proposal along with the page number references from Technical Proposal.

ATC ID Number	ATC Name Description	Date ATC Approved	Technical Proposal Reference Page(s) #
01	Temporary Detour Signal Modifications	10/9/18	14

By signing this document, the Offeror hereby confirms that they are agreeing to all conditions that may have accompanied the ATC approval(s). The Offerors shall make a note of RFP Part 4 Section 2.1.10

“If the Contract Documents incorporate any ATCs and Design-Builder, for whatever reason: (a) does not comply with one or more Department conditions of pre-approval for the ATC; (b) does not obtain required third-party approval for the ATC; or (c) fails to implement the ATC, then Design-Builder shall: (1) provide written notice thereof to Department; and (2) comply with the requirements in the Contract Documents that would have applied in the absence of such ATC. Such compliance shall be without any increase in the Contract Price or extension to the Contract Time(s). For the avoidance of doubt, Design-Builder shall not be entitled to any increase in the Contract Price or extension of the Contract Time(s) as a result of any delay, inability or cost associated with the acquisition of any property that may be required to implement any ATC”.



[Signature: Offerors POC or Principal Officer]

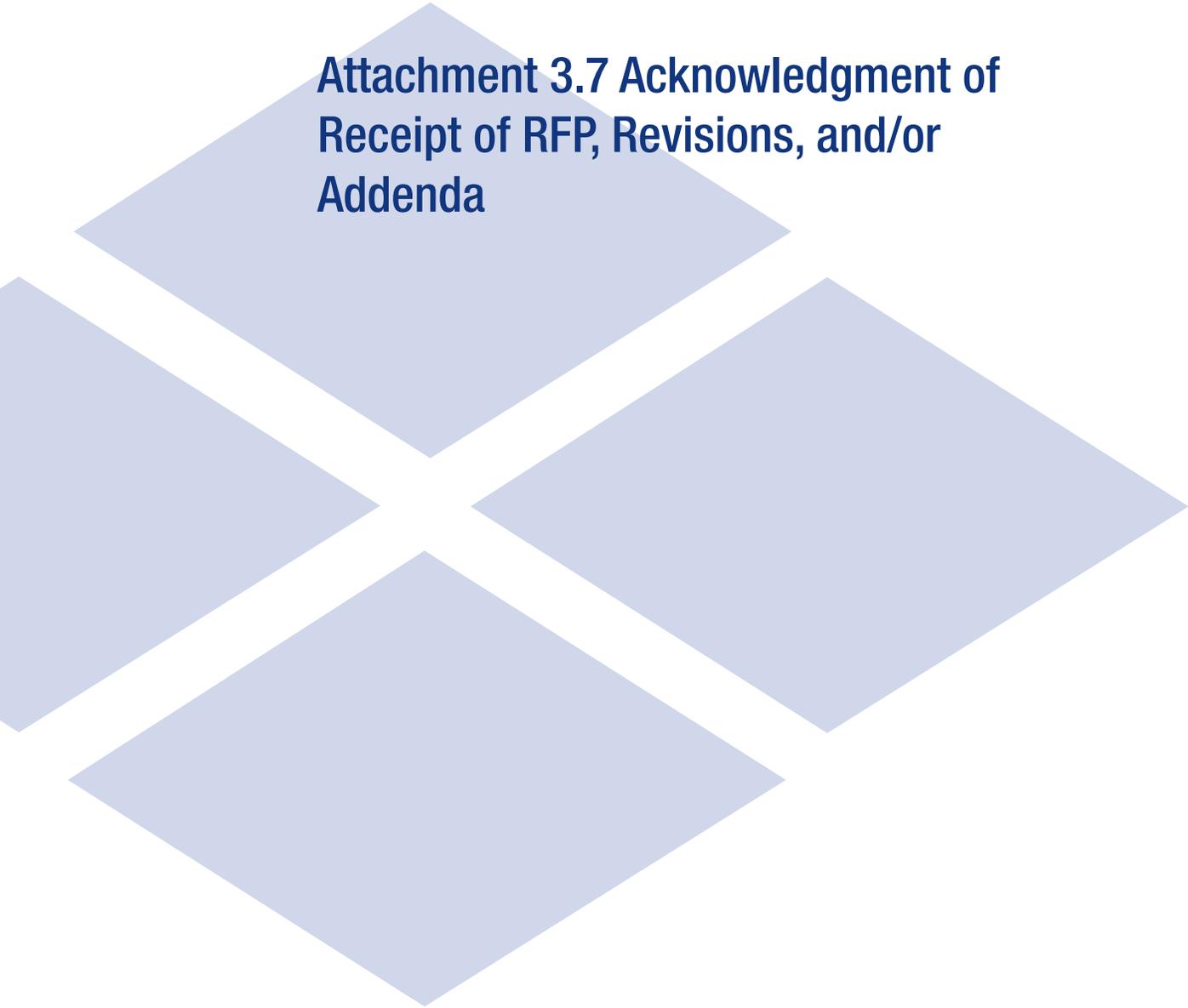
Michael E. Post

[Printed Name]

President/CEO/Manager

[Title]

DATE: November 27, 2018



**Attachment 3.7 Acknowledgment of
Receipt of RFP, Revisions, and/or
Addenda**

ATTACHMENT 3.7

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION**

ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA

RFP NO.	C00106573DB101
PROJECT NO.:	0007-253-109

Acknowledgement shall be made of receipt of the Request for Proposals (RFP) and/or any and all revisions and/or addenda pertaining to the above designated project which are issued by the Department prior to the Letter of Submittal submission date shown herein. Failure to include this acknowledgement in the Letter of Submittal may result in the rejection of your proposal.

By signing this Attachment 3.7, the Offeror acknowledges receipt of the RFP and/or following revisions and/or addenda to the RFP for the above designated project which were issued under cover letter(s) of the date(s) shown hereon:

1. Cover letter of RFP – June 18, 2018
(Date)
2. Cover letter of RFP Addendum No. 1 – August 2, 2018
(Date)
3. Cover letter of RFP Addendum No. 2 – September 5, 2018
(Date)
4. Cover letter of RFP Addendum No. 3 – September 18, 2018
(Date)
5. Cover letter of RFP Addendum No. 4 – October 5, 2018
(Date)
6. Cover letter of RFP Addendum No. 5 – October 15, 2018
(Date)
7. Cover letter of RFP Addendum No. 6 – November 2, 2018
(Date)
8. Cover letter of RFP Addendum No. 7 – November 14, 2018
(Date)
9. Cover letter of RFP Addendum No. 8 – November 16, 2018
(Date)



 SIGNATURE

November 27, 2018

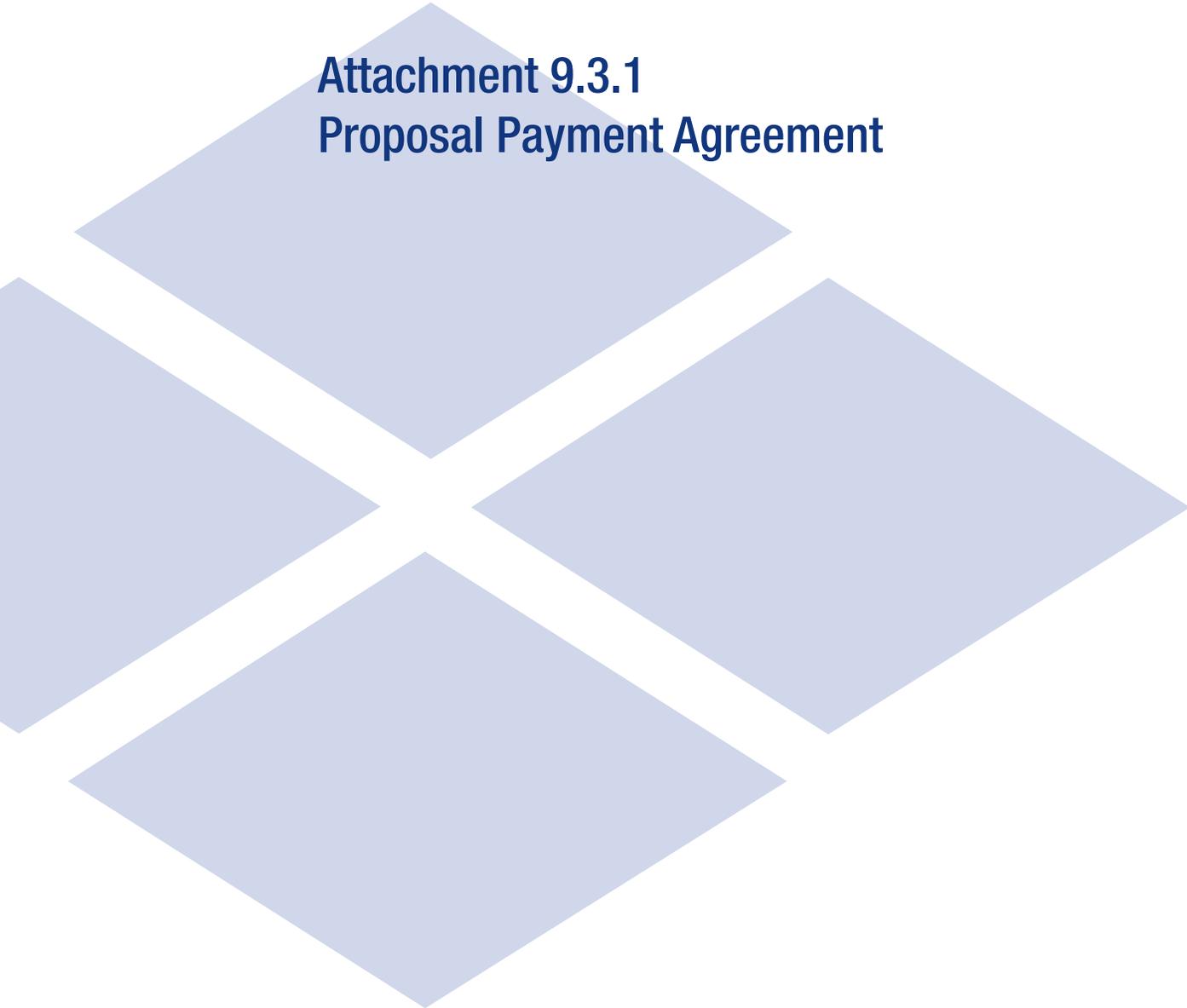
 DATE

Michael E. Post

 PRINTED NAME

President/CEO/Manager

 TITLE



**Attachment 9.3.1
Proposal Payment Agreement**

ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this “Agreement”) is made and entered into as of this ____ day of _____, 20 18, by and between the Virginia Department of Transportation (“VDOT”), and Shirley Contracting Company, LLC (“Offeror”).

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s December 8, 2017 Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the **Route 7 and Battlefield Parkway Interchange, Project No. 0007-253-109** (“Project”), under a design-build contract with VDOT (“Design-Build Contract”); and

WHEREAS, as part of the procurement process for the Project, Offeror has already provided and/or furnished to VDOT, and may continue to provide and/or furnish to VDOT, certain intellectual property, materials, information and ideas, including, but not limited to, such matters that are: (a) conveyed verbally and in writing during proprietary meetings or interviews; and (b) contained in, related to or associated with Offeror’s proposal, including, but not limited to, written correspondence, designs, drawings, plans, exhibits, photographs, reports, printed material, tapes, electronic disks, or other graphic and visual aids (collectively “Offeror’s Intellectual Property”); and

WHEREAS, VDOT is willing to provide a payment to Offeror, subject to the express conditions stated in this Agreement, to obtain certain rights in Offeror’s Intellectual Property, provided that Offeror submits a proposal that VDOT determines to be responsive to the RFP (“Offeror’s Proposal”), and either (a) Offeror is not awarded the Design-Build Contract; or (b) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror; and

WHEREAS, Offeror wishes to receive the payment offered by VDOT, in exchange for granting VDOT the rights set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements set forth in this Agreement and other good and valuable consideration, the receipt and adequacy of which are acknowledged by the parties, the parties agree as follows:

1. **VDOT's Rights in Offeror's Intellectual Property.** Offeror hereby conveys to VDOT all rights, title and interest, free and clear of all liens, claims and encumbrances, in Offeror's Intellectual Property, which includes, without restriction or limitation, the right of VDOT, and anyone contracting with VDOT, to incorporate any ideas or information from Offeror's Intellectual Property into: (a) the Design-Build Contract and the Project; (b) any other contract awarded in reference to the Project; or (c) any subsequent procurement by VDOT. In receiving all rights, title and interest in Offeror's Intellectual Property, VDOT is deemed to own all intellectual property rights, copyrights, patents, trade secrets, trademarks, and service marks in Offeror's Intellectual Property, and Offeror agrees that it shall, at the request of VDOT, execute all papers and perform all other acts that may be necessary to ensure that VDOT's rights, title and interest in Offeror's Intellectual Property are protected. The rights conferred herein to VDOT include, without limitation, VDOT's ability to use Offeror's Intellectual Property without the obligation to notify or seek permission from Offeror.

2. **Exclusions from Offeror's Intellectual Property.** Notwithstanding Section 1 above, it is understood and agreed that Offeror's Intellectual Property is not intended to include, and Offeror does not convey any rights to, the Escrow Proposal Documents submitted by Offeror in accordance with the RFP.

3. **Proposal Payment.** VDOT agrees to pay Offeror the lump sum amount of **Fifty Thousand and 00/100 Dollars (\$50,000.00)** ("Proposal Payment"), which payment constitutes payment in full to Offeror for the conveyance of Offeror's Intellectual Property to VDOT in accordance with this Agreement. Payment of the Proposal Payment is conditioned upon: (a) Offeror's Proposal being, in the sole discretion of VDOT, responsive to the RFP; (b) Offeror complying with all other terms and conditions of this Agreement; and (c) either (i) Offeror is not awarded the Design-Build Contract, or (ii) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror.

4. **Payment Due Date.** Subject to the conditions set forth in this Agreement, VDOT will make payment of the Proposal Payment to the Offeror within forty-five (45) days after the later of: (a) notice from VDOT that it has awarded the Design-Build Contract to another Offeror; or (b) notice from VDOT that the procurement for the Project has been cancelled and that there will be no Contract Award.

5. **Effective Date of this Agreement.** The rights and obligations of VDOT and Offeror under this Agreement, including VDOT's ownership rights in Offeror's Intellectual Property, vests upon the date that Offeror's Proposal is submitted to VDOT. Notwithstanding the above, if Offeror's Proposal is determined by VDOT, in its sole discretion, to be nonresponsive to the RFP, then Offeror is deemed to have waived its right to obtain the Proposal Payment, and VDOT shall have no obligations under this Agreement.

6. **Indemnity.** Subject to the limitation contained below, Offeror shall, at its own expense, indemnify, protect and hold harmless VDOT and its agents, directors, officers, employees, representatives and contractors from all claims, costs, expenses, liabilities, demands, or suits at law or equity (“Claims”) of, by or in favor of or awarded to any third party arising in whole or in part from: (a) the negligence or wilful misconduct of Offeror or any of its agents, officers, employees, representatives or subcontractors; or (b) breach of any of Offeror’s obligations under this Agreement, including its representation and warranty under Section 8 hereof. This indemnity shall not apply with respect to any Claims caused by or resulting from the sole negligence or wilful misconduct of VDOT, or its agents, directors, officers, employees, representatives or contractors.

7. **Assignment.** Offeror shall not assign this Agreement, without VDOT's prior written consent, which consent may be given or withheld in VDOT’s sole discretion. Any assignment of this Agreement without such consent shall be null and void.

8. **Authority to Enter into this Agreement.** By executing this Agreement, Offeror specifically represents and warrants that it has the authority to convey to VDOT all rights, title, and interest in Offeror’s Intellectual Property, including, but not limited to, those any rights that might have been vested in team members, subcontractors, consultants or anyone else who may have contributed to the development of Offeror’s Intellectual Property, free and clear of all liens, claims and encumbrances.

9. **Miscellaneous.**

a. Offeror and VDOT agree that Offeror, its team members, and their respective employees are not agents of VDOT as a result of this Agreement.

b. Any capitalized term used herein but not otherwise defined shall have the meanings set forth in the RFP.

c. This Agreement, together with the RFP, embodies the entire agreement of the parties with respect to the subject matter hereof. There are no promises, terms, conditions, or obligations other than those contained herein or in the RFP, and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

d. It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement is by the courts held to be illegal or in conflict with any law of the Commonwealth of Virginia, validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provisions to be invalid.

e. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia.

IN WITNESS WHEREOF, this Agreement has been executed and delivered as of the day and year first above written.

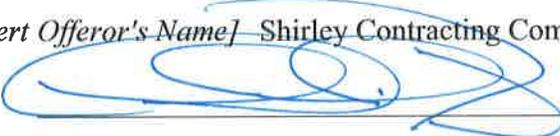
VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

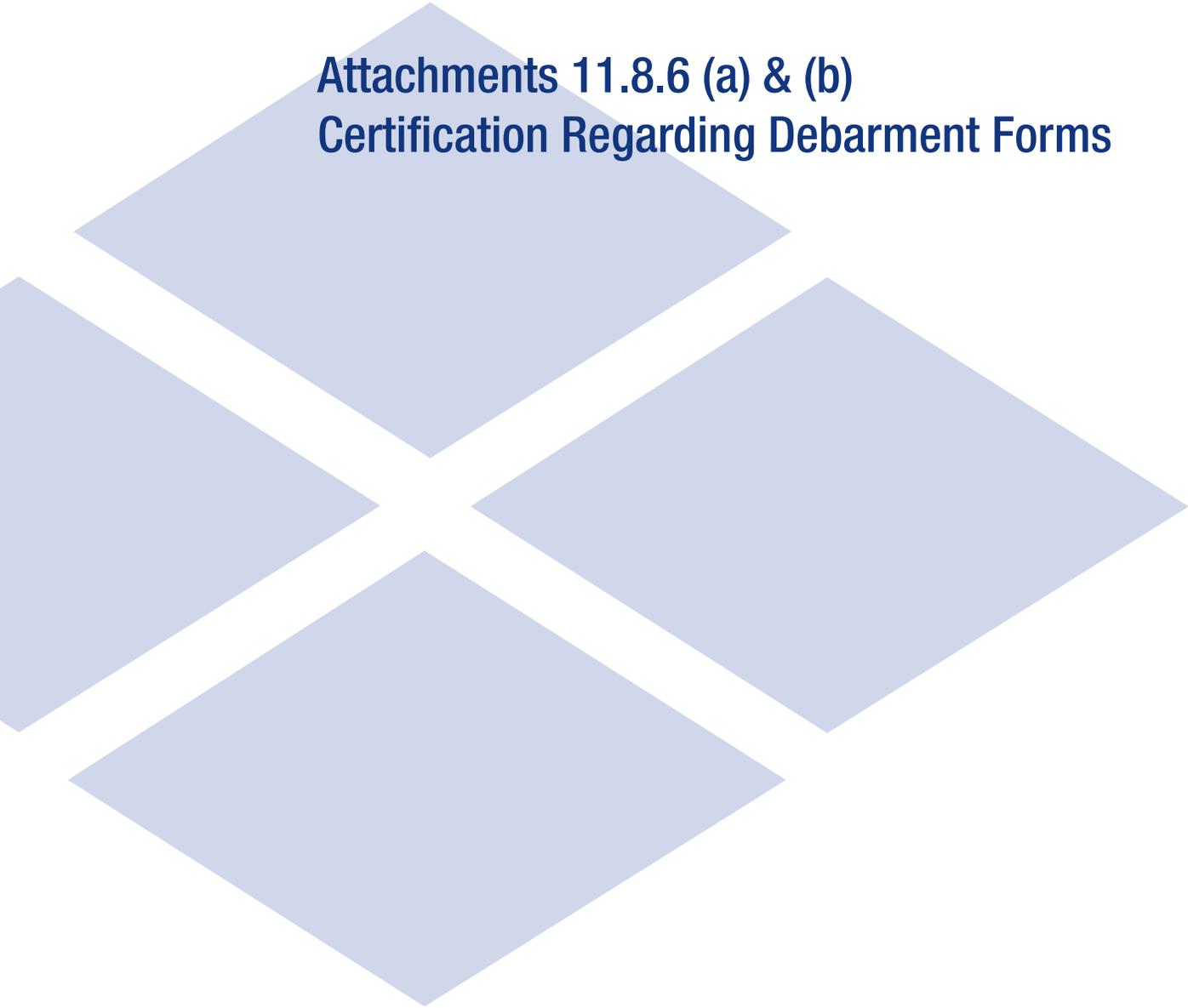
Title: _____

[Insert Offeror's Name] – Shirley Contracting Company, LLC

By:  _____

Name: Michael E. Post

Title: President/CEO/Manager



Attachments 11.8.6 (a) & (b)
Certification Regarding Debarment Forms

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0007-253-109

1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

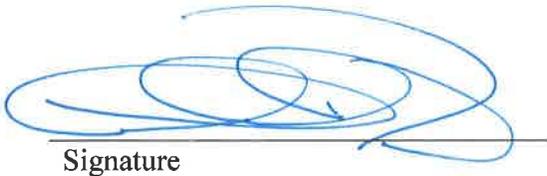
b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; and have not been convicted of any violations of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, or receiving stolen property;

c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1) b) of this certification; and

d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.


Signature

November 27, 2018
Date

President/CEO/Manager
Title

Shirley Contracting Company, LLC
Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

- 1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- 2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

Dave Mahoney 11/5/18 Executive Vice President
Signature Date Title

Dewberry Engineers Inc.
Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

 _____ Signature	11/06/2018 _____ Date	<i>President</i> _____ Title
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CES CONSULTING LLC

Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

- 1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

- 2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.



Signature

11/06/2018

Date

Senior Principal

Title

GeoConcepts Engineering, Inc.

Name of Firm

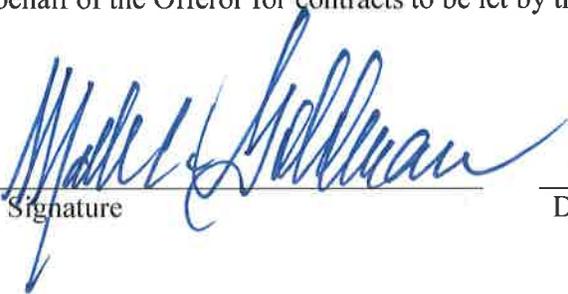
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

- 1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

- 2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.



Signature

11/05/2018
Date

PROJECT MANAGER
Title

SURVEYING AND MAPPING, LLC

Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

<u>W. J. McKeague</u>	<u>11/5/2018</u>	<u>Vice President</u>
Signature	Date	Title

Quantum Spatial, Inc.
Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

- 1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

- 2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

 _____ Signature	<u>9/20/18</u> _____ Date	<u>President</u> _____ Title
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Name of Firm Delles Geotechnical & Material Testing Services, Inc. (D&MTS)

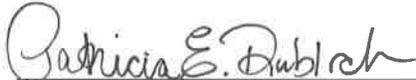
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.



Signature

11/8/2018

Date

President

Title

Diversified Property Services, Inc.

Name of Firm

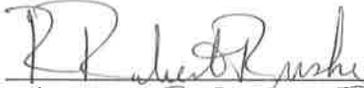
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0007-253-109

- 1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

- 2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

 _____ Signature <u>F. Robert Rushe</u>	<u>11-7-18</u> _____ Date	<u>Vice President</u> _____ Title
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Old Dominion Settlements, Inc., T/A Key Title

Name of Firm

Response to Request for Proposals

ROUTE 7 AND BATTLEFIELD PARKWAY INTERCHANGE

Town of Leesburg, Virginia

State Project No.: 0007-253-109, P101, R201, C501, B601

Federal Project No: STP-5A01(704)

Contract ID Number: C00106573DB101

VOLUME II: DESIGN CONCEPT



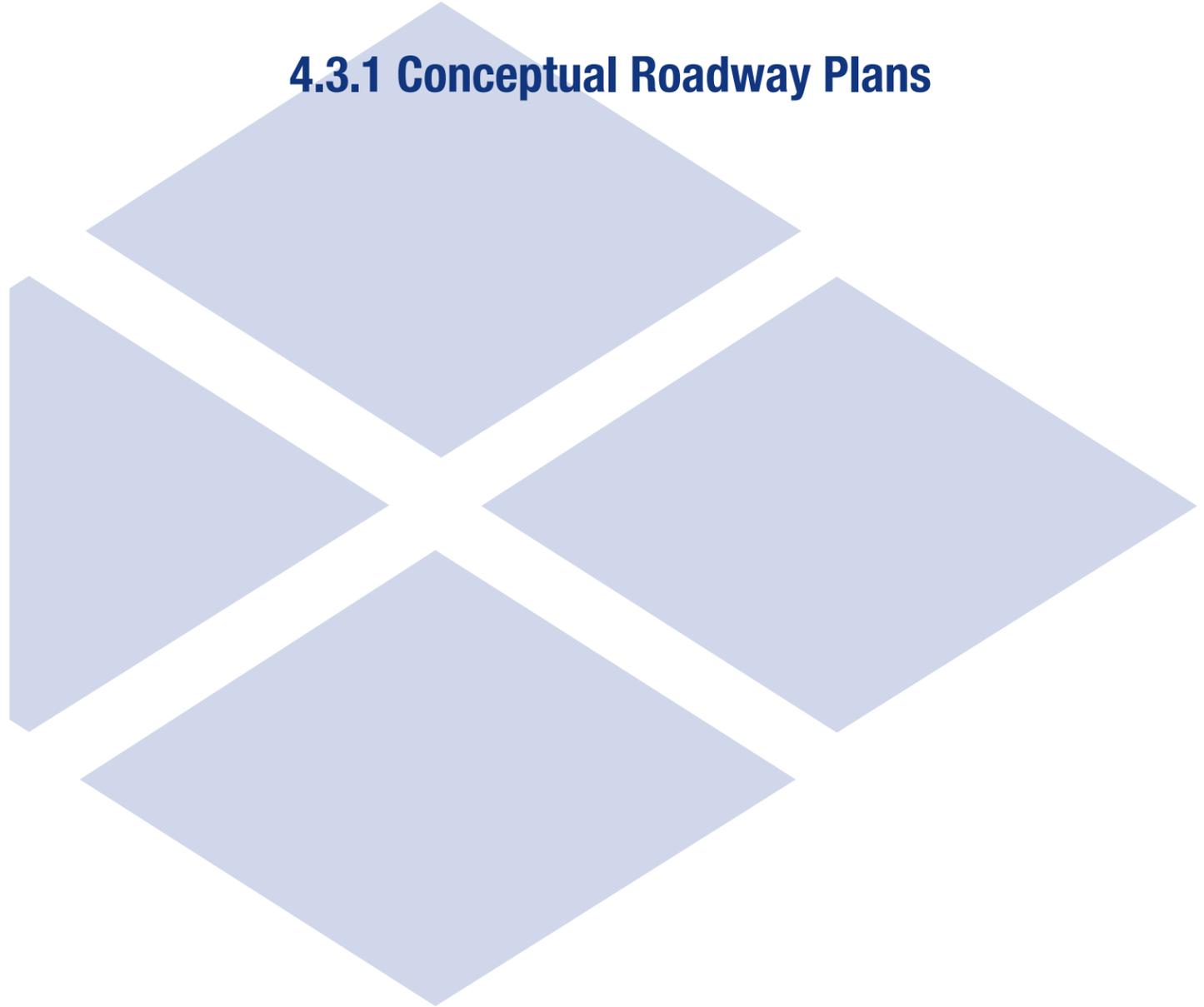
SUBMITTED BY:



IN ASSOCIATION WITH:



4.3.1 Conceptual Roadway Plans

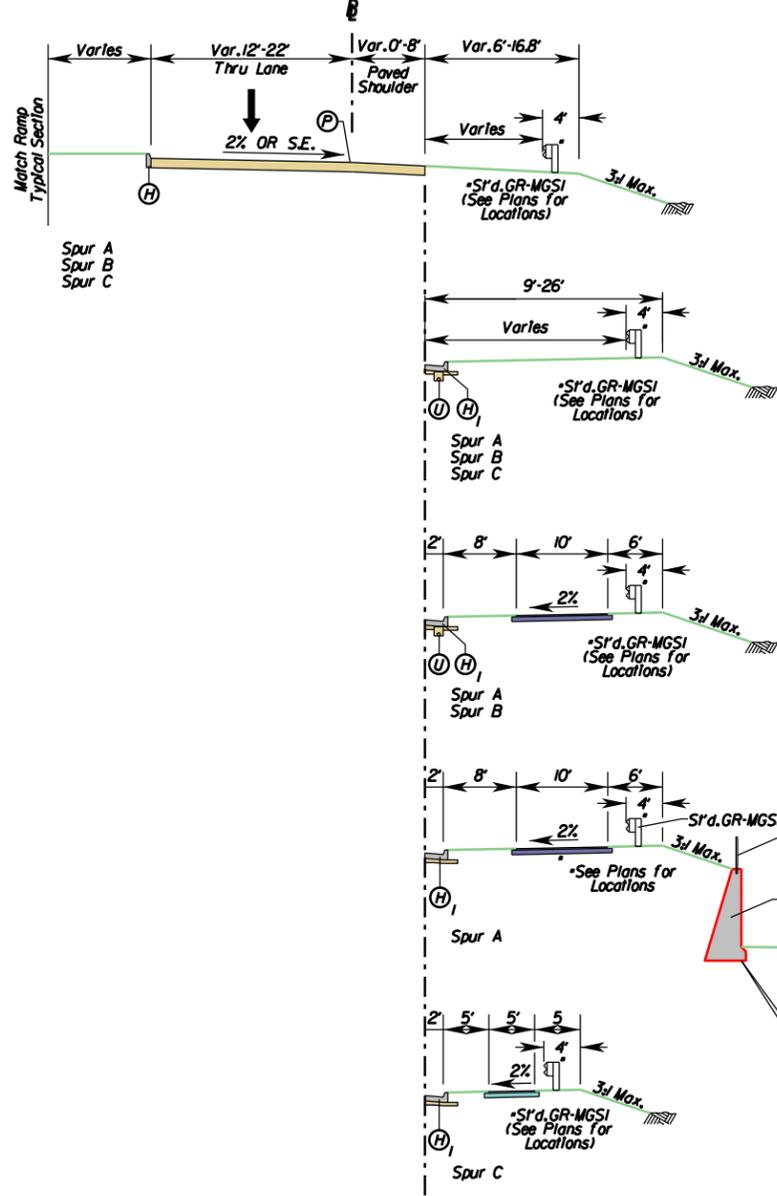


TYPICAL SECTIONS

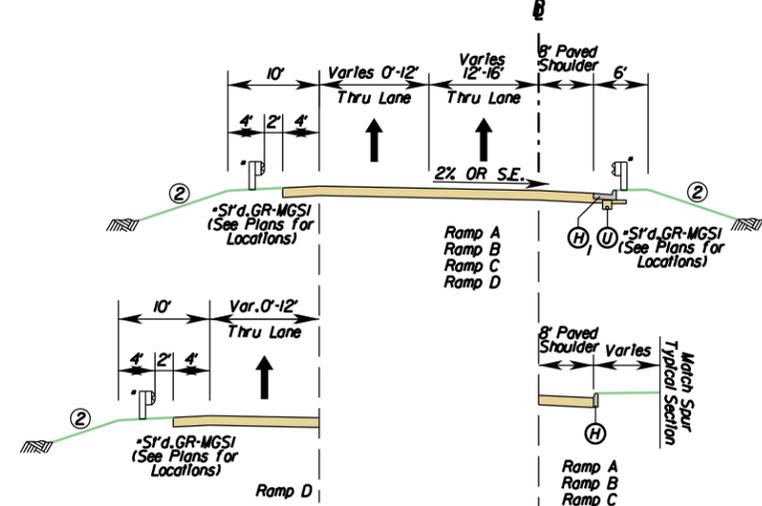
STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	7	0007-029-225 P101, R201, C501 0007-029-942 P101, R201, C501	2A(2)



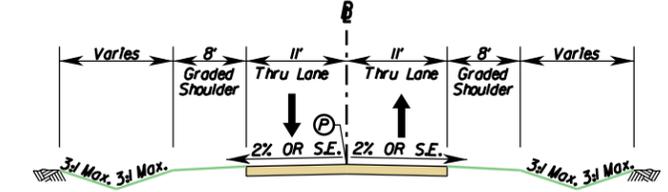
Interchange Spur A,B,C (GS-R)



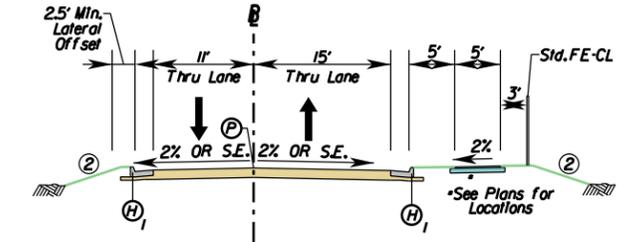
Interchange Ramp A,B,C,D (GS-R)



West Driveway Local Street (GS-8)



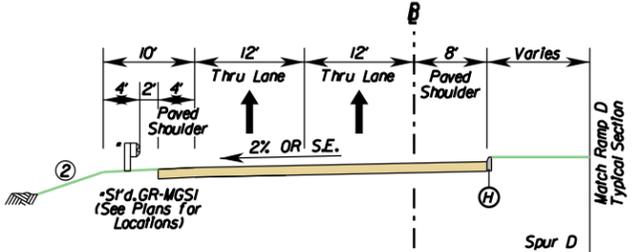
Keystone Drive Local Street (GS-8)



DESIGN ENHANCEMENT
Adjusted retaining wall location results in reduced wall length and height, and accommodates future landscaping above the retaining wall.

DESIGN ENHANCEMENT
Adjusted retaining wall location results in reduced wall length and height, and accommodates future landscaping above the retaining wall.

Interchange Spur D (GS-R)



LEGEND

- (H) Curb, S'd. CG-2 Req'd.
- (H₁) Curb & Gutter, S'd. CG-6 Req'd.
- (H₂) Curb, S'd. CG-3 Req'd.
- (H₃) Curb & Gutter, S'd. CG-7 Req'd.
- (J) Raised Concrete Median Strip, S'd. MS-1A Req'd.
- (K) Raised Grass Median Strip, S'd. MS-2 Req'd.
- (L) Bridge Pier Protection System, BPPS-1 or BPPS-2
- (P) Profile Grade Line (PGL) / Point of Rotation
- (U) Underdrain, S'd. UD-4 Req'd.
- Proposed Grass Median / Buffer / Planted Area
- Proposed Roadway Pavement
- Proposed Shared-Use-Path
- Proposed Sidewalk

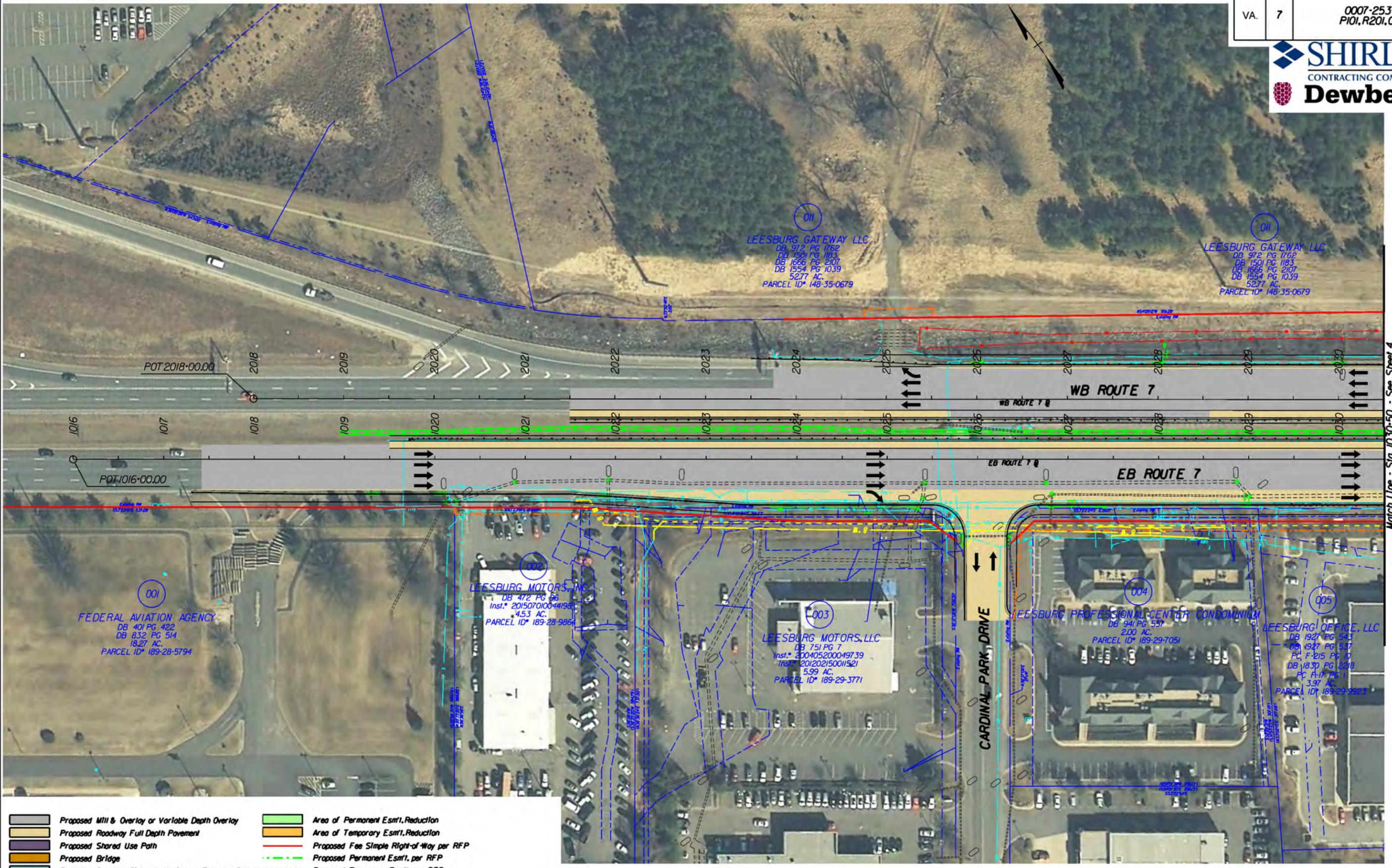
Note 1: Minimum pavement sections will match Part 2, Section 2.6J of the RFP
Note 2: All pavement build-up and widening will match Attachment 2.6J of the RFP

① See Plansheets 3-11 for Limits of Mill and Overlay and Full Depth Pavement Construction
② CS-4/4E

Note: All slopes within the landscape area, as shown on Attachment 2.3JO of RFP Addendum 2, are not to exceed a 3d gradient.

SCALE 0 10' 20'	PROJECT 0007-029-225 0007-029-942	SHEET NO. 2A(2)
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STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	7	0007-253-109 PI01,R201,C501	3



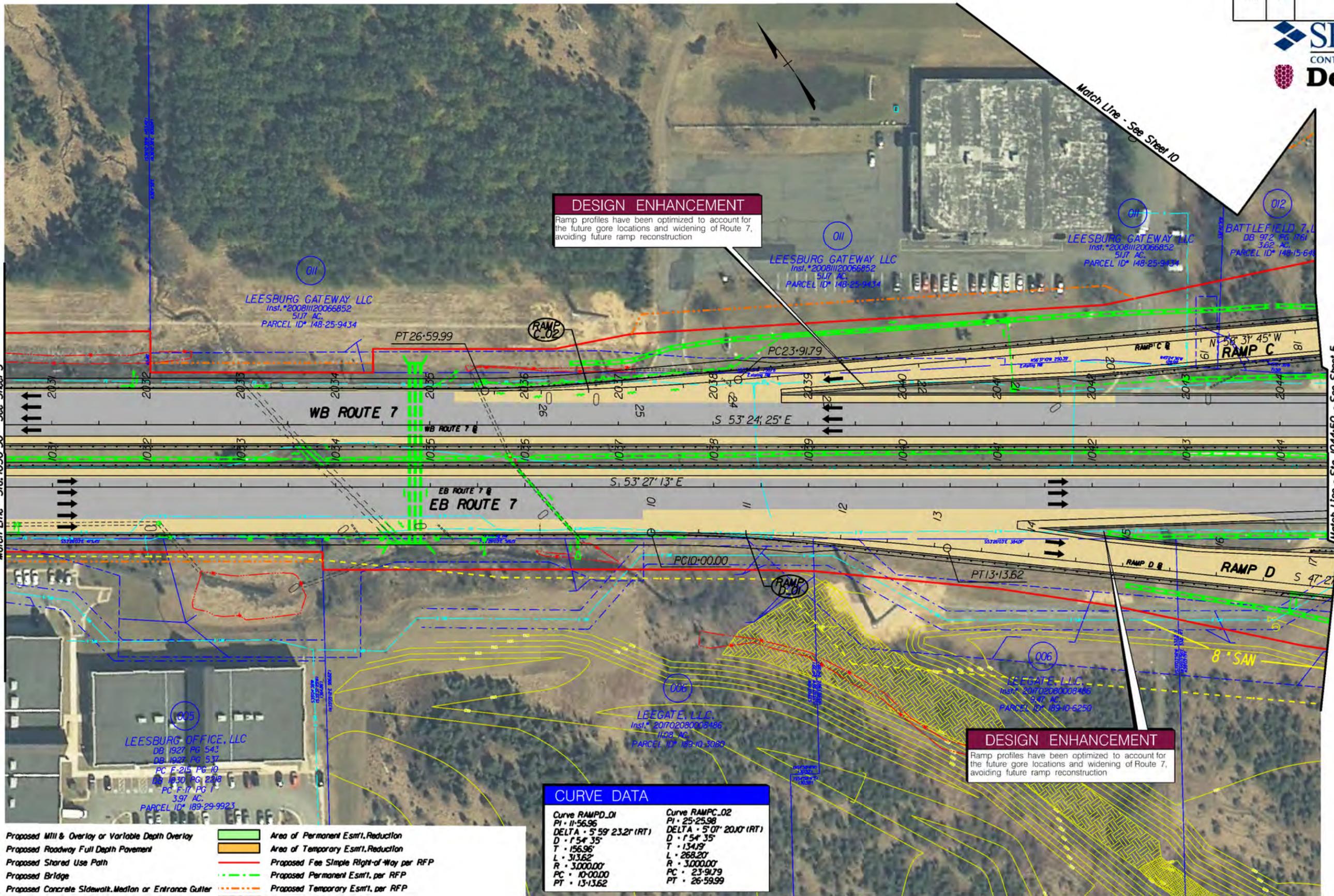
March Line - Sta. 1030+50 - See Sheet 4

- | | |
|---|--|
| Proposed Mill & Overlay or Variable Depth Overlay | Area of Permanent Esm't, Reduction |
| Proposed Roadway Full Depth Pavement | Area of Temporary Esm't, Reduction |
| Proposed Shared Use Path | Proposed Fee Simple Right-of-Way per RFP |
| Proposed Bridge | Proposed Permanent Esm't, per RFP |
| Proposed Concrete Sidewalk, Median or Entrance Gutter | Proposed Temporary Esm't, per RFP |
| Proposed Gross Median/Buffer/Planted Area | Proposed Utility Relocations |
| Proposed Stormwater Management Facility | Existing Utility Designations per RFP |
| Area of Fee Simple Right-Of-Way Reduction | Denotes Proposed Retaining Wall |

SCALE 0 50' 100'	PROJECT 0007-253-109	SHEET NO. 3
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STATE	ROUTE	PROJECT	SHEET NO.
VA.	7	0007-253-109 P101,R201,C501	4

SHIRLEY
CONTRACTING COMPANY, LLC
Dewberry



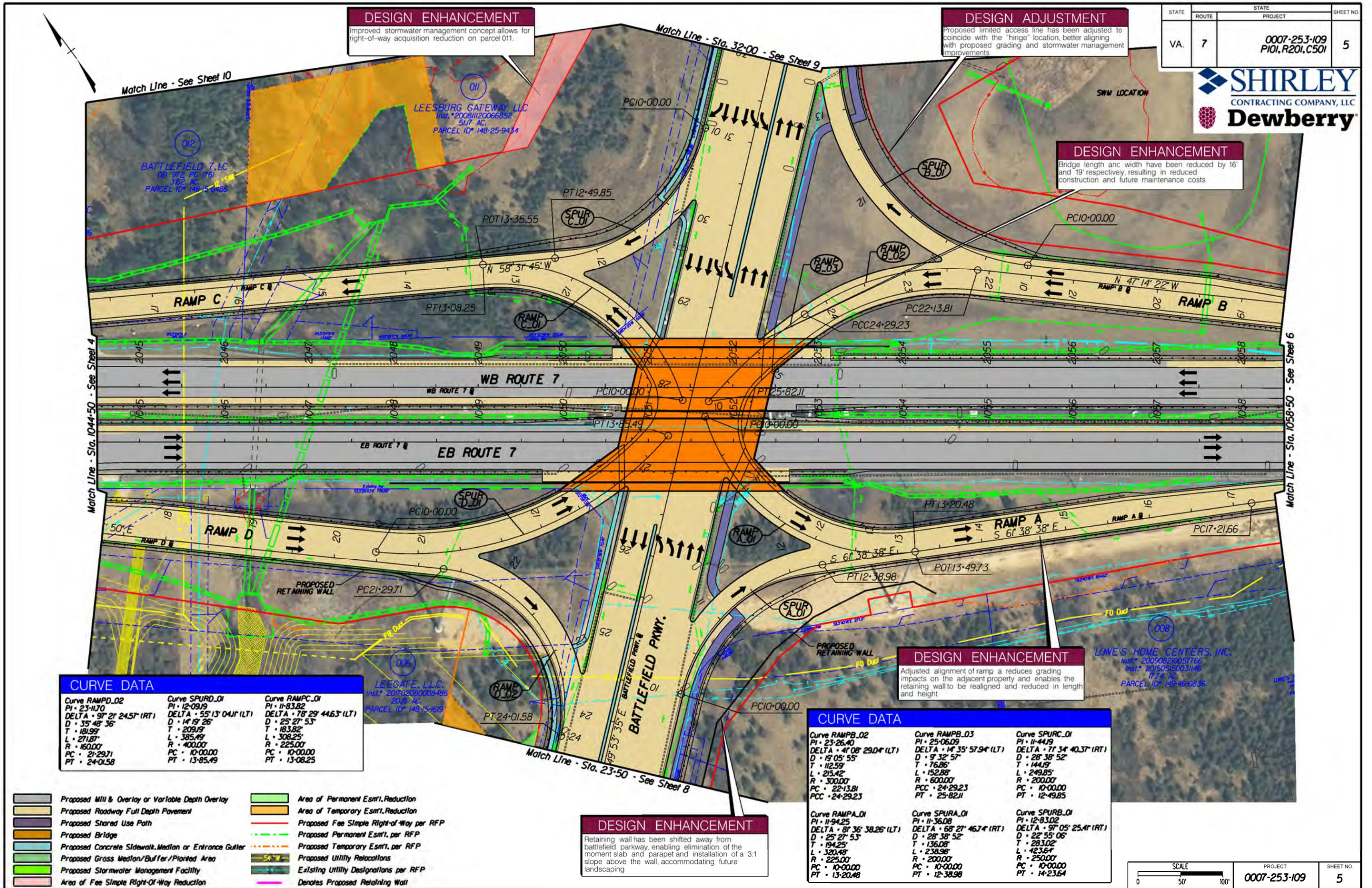
DESIGN ENHANCEMENT
Ramp profiles have been optimized to account for the future gore locations and widening of Route 7, avoiding future ramp reconstruction

DESIGN ENHANCEMENT
Ramp profiles have been optimized to account for the future gore locations and widening of Route 7, avoiding future ramp reconstruction

CURVE DATA

Curve RAMPD_01 PI • 11-56.96 DELTA • S 59° 23.2' (RT) D • 154° 35' T • 156.96' L • 313.62' R • 3,000.00' PC • 10-00.00 PT • 13-13.62	Curve RAMP_C_02 PI • 25-25.98 DELTA • 5° 07' 20.0" (RT) D • 154° 35' T • 134.19' L • 268.20' R • 3,000.00' PC • 23-91.79 PT • 26-59.99
--	--

- Proposed Mill & Overlay or Variable Depth Overlay
- Proposed Roadway Full Depth Pavement
- Proposed Shared Use Path
- Proposed Bridge
- Proposed Concrete Sidewalk, Median or Entrance Gutter
- Proposed Gross Median/Buffer/Planted Area
- Proposed Stormwater Management Facility
- Area of Fee Simple Right-Of-Way Reduction
- Area of Permanent Esm't, Reduction
- Area of Temporary Esm't, Reduction
- Proposed Fee Simple Right-of-Way per RFP
- Proposed Permanent Esm't, per RFP
- Proposed Temporary Esm't, per RFP
- Proposed Utility Relocations
- Existing Utility Designations per RFP
- Denotes Proposed Retaining Wall



DESIGN ENHANCEMENT
 Improved stormwater management concept allows for right-of-way acquisition reduction on parcel 011.

DESIGN ADJUSTMENT
 Proposed limited access line has been adjusted to coincide with the "hinge" location, better aligning with proposed grading and stormwater management improvements.

DESIGN ENHANCEMENT
 Bridge length and width have been reduced by 16' and 19' respectively, resulting in reduced construction and future maintenance costs.

DESIGN ENHANCEMENT
 Adjusted alignment of ramp a reduces grading impacts on the adjacent property and enables the retaining wall to be realigned and reduced in length and height.

DESIGN ENHANCEMENT
 Retaining wall has been shifted away from battlefield parkway, enabling elimination of the moment slab and parapet and installation of a 3:1 slope above the wall, accommodating future landscaping.

STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	7	0007-253-109 P101,R201,C501	5



CURVE DATA

Curve RAMPD_02 PI • 23-1170 DELTA • 97° 21' 24.57" (RT) D • 35' 48' 36" T • 181.99' L • 271.87' R • 160.00' PC • 21-2971 PT • 24-0158	Curve SPURD_01 PI • 12-0919 DELTA • 55° 13' 04.17" (LT) D • 14' 19' 26" T • 209.19' L • 385.49' R • 400.00' PC • 10-0000 PT • 13-85.49	Curve RAMP_C_01 PI • 11-83.82 DELTA • 78° 29' 44.63" (LT) D • 25' 27' 53" T • 183.82' L • 308.25' R • 225.00' PC • 10-0000 PT • 13-08.25
---	--	--

CURVE DATA

Curve RAMPB_02 PI • 23-26.40 DELTA • 41° 08' 29.04" (LT) D • 15' 05' 55" T • 112.59' L • 215.42' R • 300.00' PC • 22-13.81 PCC • 24-29.23 PT • 25-82.11	Curve RAMPB_03 PI • 25-06.09 DELTA • 14° 35' 57.94" (LT) D • 9' 32' 57" T • 76.86' L • 152.88' R • 600.00' PCC • 24-29.23 PT • 25-82.11	Curve SPURC_01 PI • 11-44.19 DELTA • 71° 34' 40.37" (RT) D • 28' 38' 52" T • 144.19' L • 249.85' R • 200.00' PC • 10-0000 PT • 12-49.85
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CURVE DATA

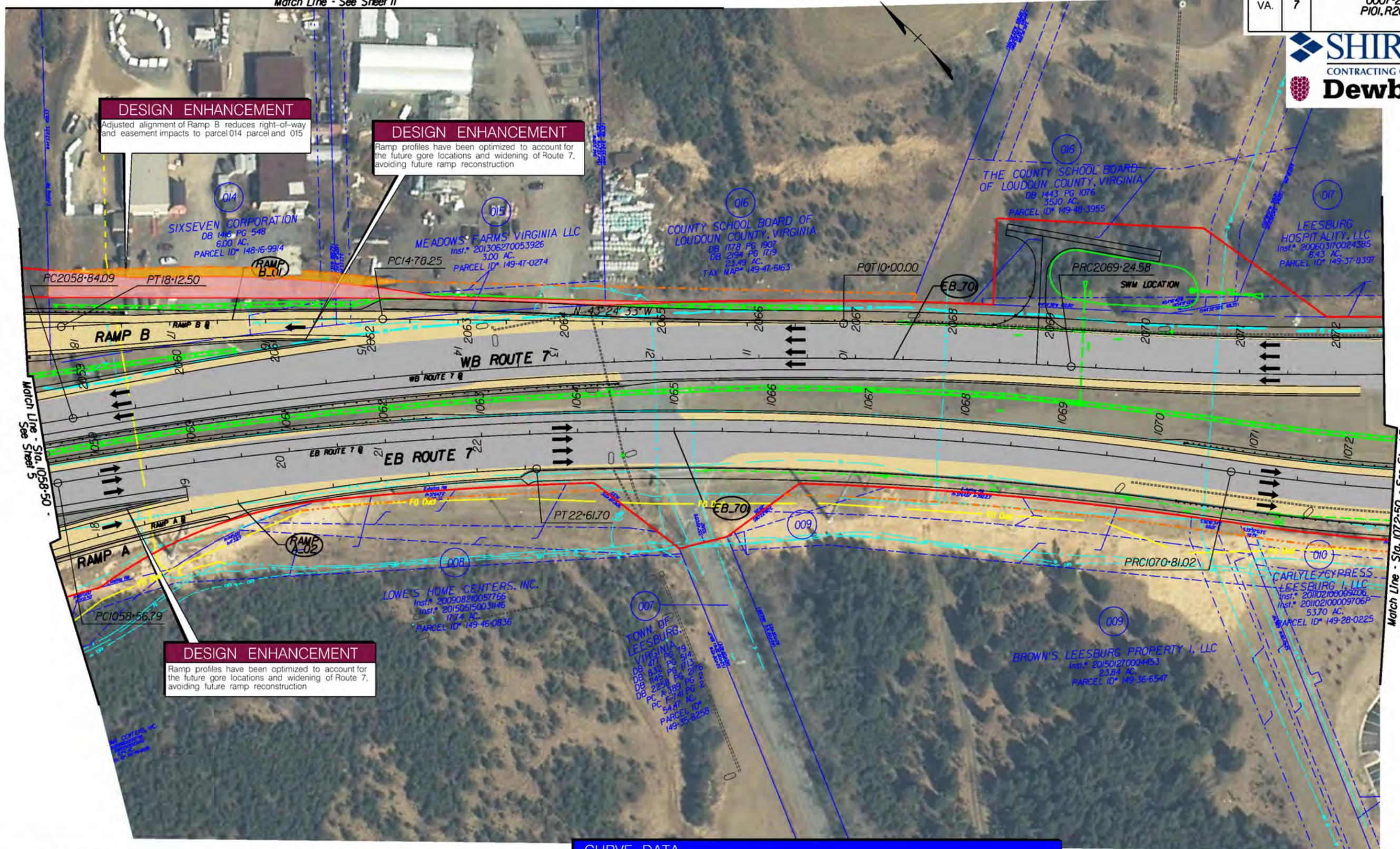
Curve RAMP_A_01 PI • 11-94.25 DELTA • 81° 36' 38.26" (LT) D • 25' 27' 53" T • 194.25' L • 320.48' R • 225.00' PC • 10-0000 PT • 13-20.48	Curve SPUR_A_01 PI • 11-36.08 DELTA • 68° 27' 46.74" (RT) D • 28' 38' 52" T • 136.08' L • 238.98' R • 200.00' PC • 10-0000 PT • 12-38.98	Curve SPUR_B_01 PI • 12-83.02 DELTA • 97° 05' 25.41" (RT) D • 22' 55' 06" T • 283.02' L • 423.64' R • 250.00' PC • 10-0000 PT • 14-23.64
--	--	--

- Proposed Mill & Overlay or Variable Depth Overlay
- Proposed Roadway Full Depth Pavement
- Proposed Shared Use Path
- Proposed Bridge
- Proposed Concrete Sidewalk, Median or Entrance Gutter
- Proposed Gross Median/Buffer/Planted Area
- Proposed Stormwater Management Facility
- Area of Fee Simple Right-Of-Way Reduction
- Area of Permanent Esm't, Reduction
- Area of Temporary Esm't, Reduction
- Proposed Fee Simple Right-of-Way per RFP
- Proposed Permanent Esm't, per RFP
- Proposed Temporary Esm't, per RFP
- Proposed Utility Relocations
- Existing Utility Designations per RFP
- Denotes Proposed Retaining Wall

SCALE 0 50' 100'	PROJECT 0007-253-109	SHEET NO. 5
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Match Line - See Sheet II



DESIGN ENHANCEMENT
Adjusted alignment of Ramp B reduces right-of-way and easement impacts to parcel 014 parcel and 015

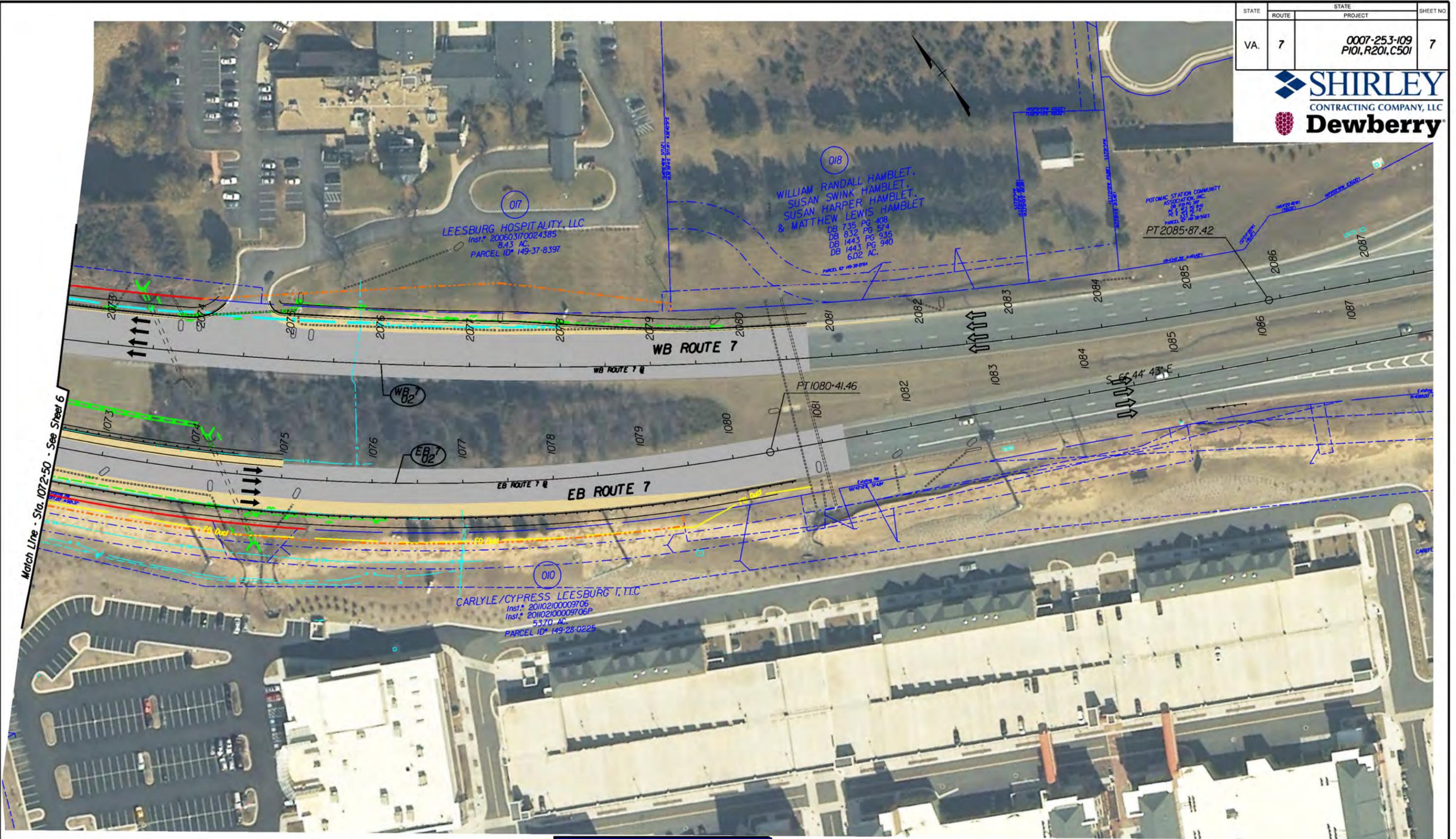
DESIGN ENHANCEMENT
Ramp profiles have been optimized to account for the future gore locations and widening of Route 7, avoiding future ramp reconstruction

DESIGN ENHANCEMENT
Ramp profiles have been optimized to account for the future gore locations and widening of Route 7, avoiding future ramp reconstruction

- | | |
|---|--|
| Proposed Mill & Overlay or Variable Depth Overlay | Area of Permanent Esm'l, Reduction |
| Proposed Roadway Full Depth Pavement | Area of Temporary Esm'l, Reduction |
| Proposed Shared Use Path | Proposed Fee Simple Right-of-Way per RFP |
| Proposed Bridge | Proposed Permanent Esm'l. per RFP |
| Proposed Concrete Sidewalk, Median or Entrance Gutter | Proposed Temporary Esm'l. per RFP |
| Proposed Gross Median/Buffer/Planted Area | Proposed Utility Relocations |
| Proposed Stormwater Management Facility | Existing Utility Designations per RFP |
| Area of Fee Simple Right-Of-Way Reduction | Denotes Proposed Retaining Wall |

CURVE DATA			
Curve RAMPB_01 PI - 16-45.44 DELTA - 3° 49' 48.53" (LT) D - 108' 45" T - 167.18' L - 334.24' R - 5,000.00' PC - 14-78.25 PT - 18-12.50	Curve RAMP A_02 PI - 19-93.33 DELTA - 15° 28' 16.24" (RT) D - 2' 51' 53" T - 271.68' L - 540.05' R - 2,000.00' PC - 17-21.66 PT - 22-61.70	Curve WB_701 PI - 2064-06.56 DELTA - 12° 56' 59.80" (RT) D - 114' 41" T - 522.47' L - 1040.49' R - 4,603.55' PC - 2058-84.09 PRC - 2069-24.58	Curve EB_701 PI - 1064-73.91 DELTA - 17° 51' 53.86" (RT) D - 127' 33" T - 617.12' L - 1,224.22' R - 3,926.28' PC - 1058-56.79 PRC - 1070-81.02

STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	7	0007-253-109 P101.R201.C501	7



- Proposed Mill & Overlay or Variable Depth Overlay
- Proposed Roadway Full Depth Pavement
- Proposed Shared Use Path
- Proposed Bridge
- Proposed Concrete Sidewalk, Median or Entrance Gutter
- Proposed Gross Median/Buffer/Planted Area
- Proposed Stormwater Management Facility
- Area of Fee Simple Right-Of-Way Reduction
- Area of Permanent Esm't, Reduction
- Area of Temporary Esm't, Reduction
- Proposed Fee Simple Right-of-Way per RFP
- Proposed Permanent Esm't, per RFP
- Proposed Temporary Esm't, per RFP
- Proposed Utility Relocations
- Existing Utility Designations per RFP
- Denotes Proposed Retaining Wall

CURVE DATA	
Curve EB.702	Curve WB.702
PI • 1075+69.76	PI • 2077+65.74
DELTA • 26° 09' 24.07" (LT)	DELTA • 27° 19' 56.81" (LT)
D • 2' 43" 2"	D • 1' 16" 58"
T • 488.74'	T • 84.16'
L • 950.44'	L • 1662.83'
R • 2103.82'	R • 4466.12'
PRC • 1070+81.02	PRC • 2069+24.58
PT • 1080+41.46	PT • 2085+87.42

SCALE: 0 50' 100'

PROJECT: 0007-253-109

SHEET NO.: 7

STATE	ROUTE	PROJECT	SHEET NO.
VA.	7	0007-253-109 P101,R201,C501	8



DESIGN ENHANCEMENT
Utilization of Battlefield Parkway detour avoids need to acquire temporary construction easement on parcel 006

DESIGN ENHANCEMENT
Refined profile for Battlefield Parkway reduces variable depth overlay within the Russell Branch Parkway intersection from approximately 18" to approximately 9" (maximum)

DESIGN ENHANCEMENT
Improved horizontal lane alignment avoids widening and reconstruction of the northbound lanes of Battlefield Parkway, eliminating retaining wall reconstruction and all easement and right-of-way impacts on parcel 007

DESIGN ENHANCEMENT
Redefined roadway profile eliminates the need to vertically adjust the southwest quadrant of the intersection.

DESIGN ENHANCEMENT
Revised stormwater management concept eliminates the SWM facility in this corner, avoiding right-of-way acquisition from Parcel 008 adjacent to Russell Branch Parkway

CURVE DATA	
Curve BATTLEFIELD_01	Curve RUSSEL_02
PI • 10-62.22	PI • 35-91.46
DELTA • 33° 25' 55.8" (LT)	DELTA • 18° 49' 36.36" (LT)
D • 5' 54" 49"	D • 5' 31" 11"
T • 439.67'	T • 172.09'
L • 854.24'	L • 341.08'
R • 1,464.00'	R • 1,038.03'
PC • 6-22.56	PC • 34-19.37
PT • 14-76.80	PT • 37-60.45

	Proposed Mill & Overlay or Variable Depth Overlay		Area of Permanent Esm't, Reduction
	Proposed Roadway Full Depth Pavement		Area of Temporary Esm't, Reduction
	Proposed Shared Use Path		Proposed Fee Simple Right-of-Way per RFP
	Proposed Bridge		Proposed Permanent Esm't, per RFP
	Proposed Concrete Sidewalk, Median or Entrance Gutter		Proposed Temporary Esm't, per RFP
	Proposed Grass Median/Buffer/Planted Area		Proposed Utility Relocations
	Proposed Stormwater Management Facility		Existing Utility Designations per RFP
	Area of Fee Simple Right-Of-Way Reduction		Denotes Proposed Retaining Wall

SCALE	PROJECT	SHEET NO.
0 50' 100'	0007-253-109	8

STATE	ROUTE	PROJECT	SHEET NO.
VA.	7	0007-253-109 P101.R201.C501	9

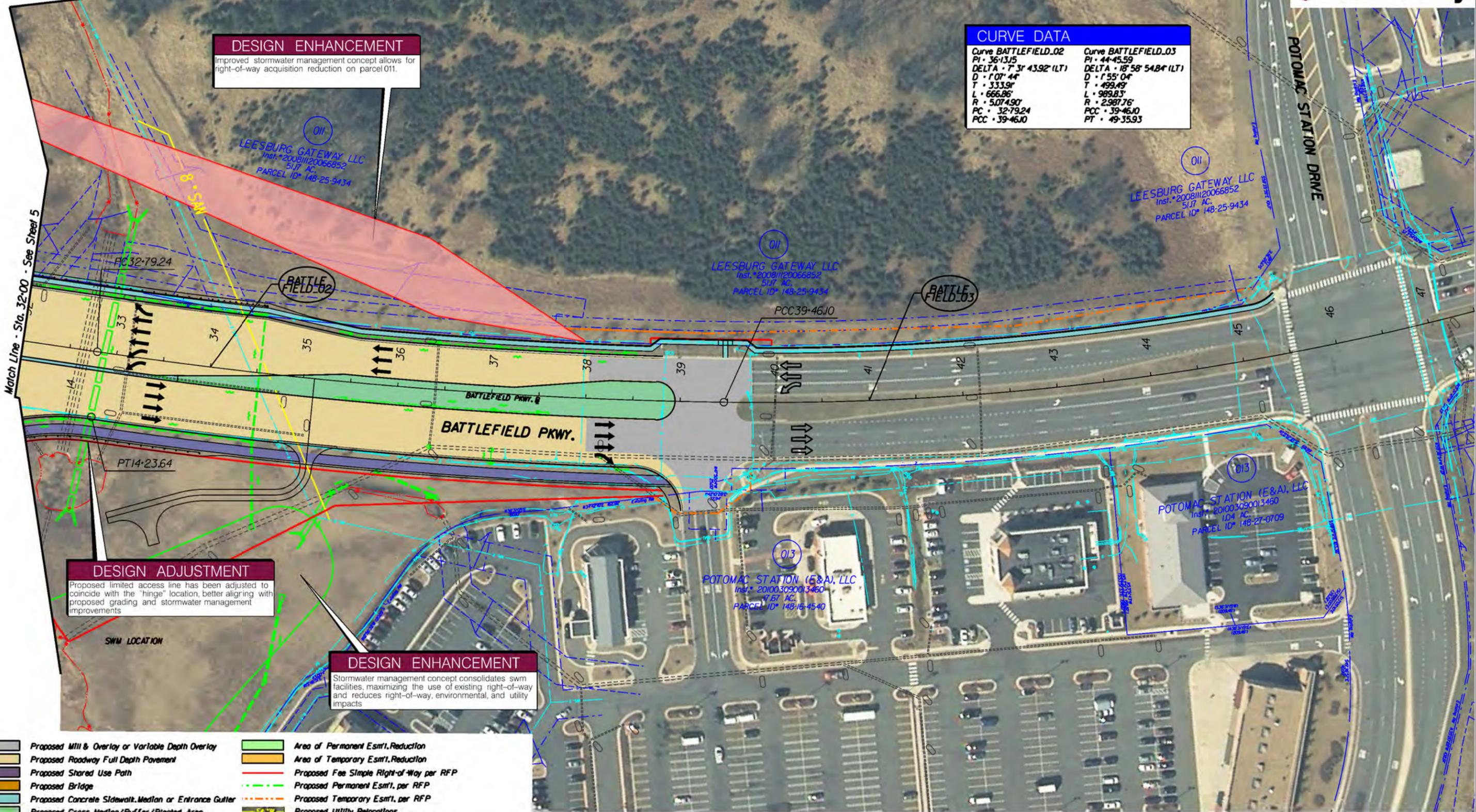


Match Line - See Sheet 10

DESIGN ENHANCEMENT
Improved stormwater management concept allows for right-of-way acquisition reduction on parcel 011.

CURVE DATA

Curve	PI	DELTA	D	T	L	R	PC	PCC	PT
Curve BATTLEFIELD.02	36+13.75	7° 31' 43.92" (LT)	107.44'	333.91'	666.86'	507.490'	32+79.24	39+46.10	
Curve BATTLEFIELD.03	44+45.59	18° 58' 54.84" (LT)	155.04'	499.49'	989.83'	2987.76'	39+46.10	49+35.93	

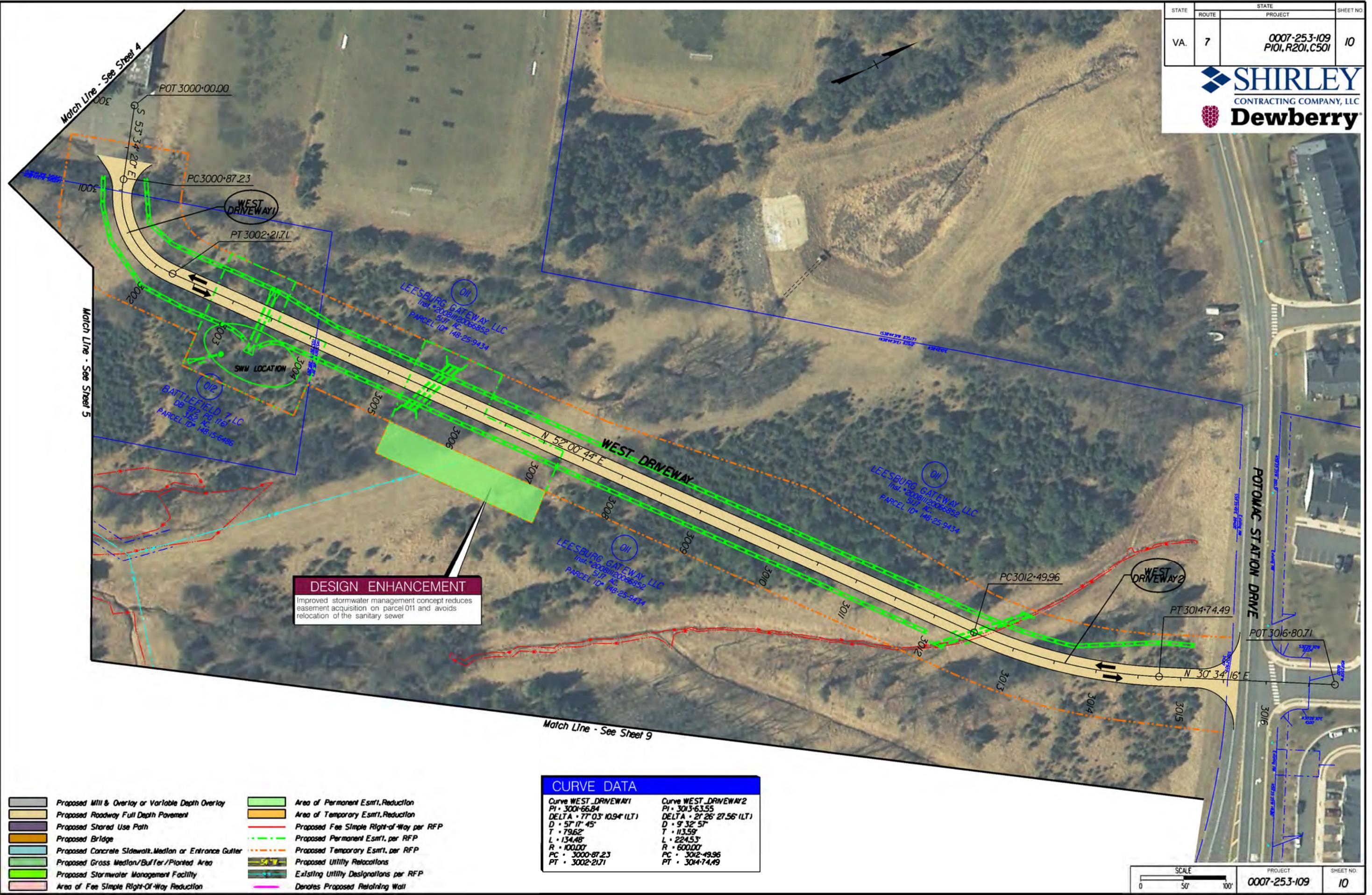


DESIGN ADJUSTMENT
Proposed limited access line has been adjusted to coincide with the "hinge" location, better aligning with proposed grading and stormwater management improvements

DESIGN ENHANCEMENT
Stormwater management concept consolidates swm facilities, maximizing the use of existing right-of-way and reduces right-of-way, environmental, and utility impacts

- | | | | |
|--|---|--|--|
| | Proposed Mill & Overlay or Variable Depth Overlay | | Area of Permanent Esm't, Reduction |
| | Proposed Roadway Full Depth Pavement | | Area of Temporary Esm't, Reduction |
| | Proposed Shared Use Path | | Proposed Fee Simple Right-of-Way per RFP |
| | Proposed Bridge | | Proposed Permanent Esm't, per RFP |
| | Proposed Concrete Sidewalk, Median or Entrance Gutter | | Proposed Temporary Esm't, per RFP |
| | Proposed Grass Median/Buffer/Planted Area | | Proposed Utility Relocations |
| | Proposed Stormwater Management Facility | | Existing Utility Designations per RFP |
| | Area of Fee Simple Right-Of-Way Reduction | | Denotes Proposed Retaining Wall |

STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	7	0007-253-109 P101, R201, C501	10

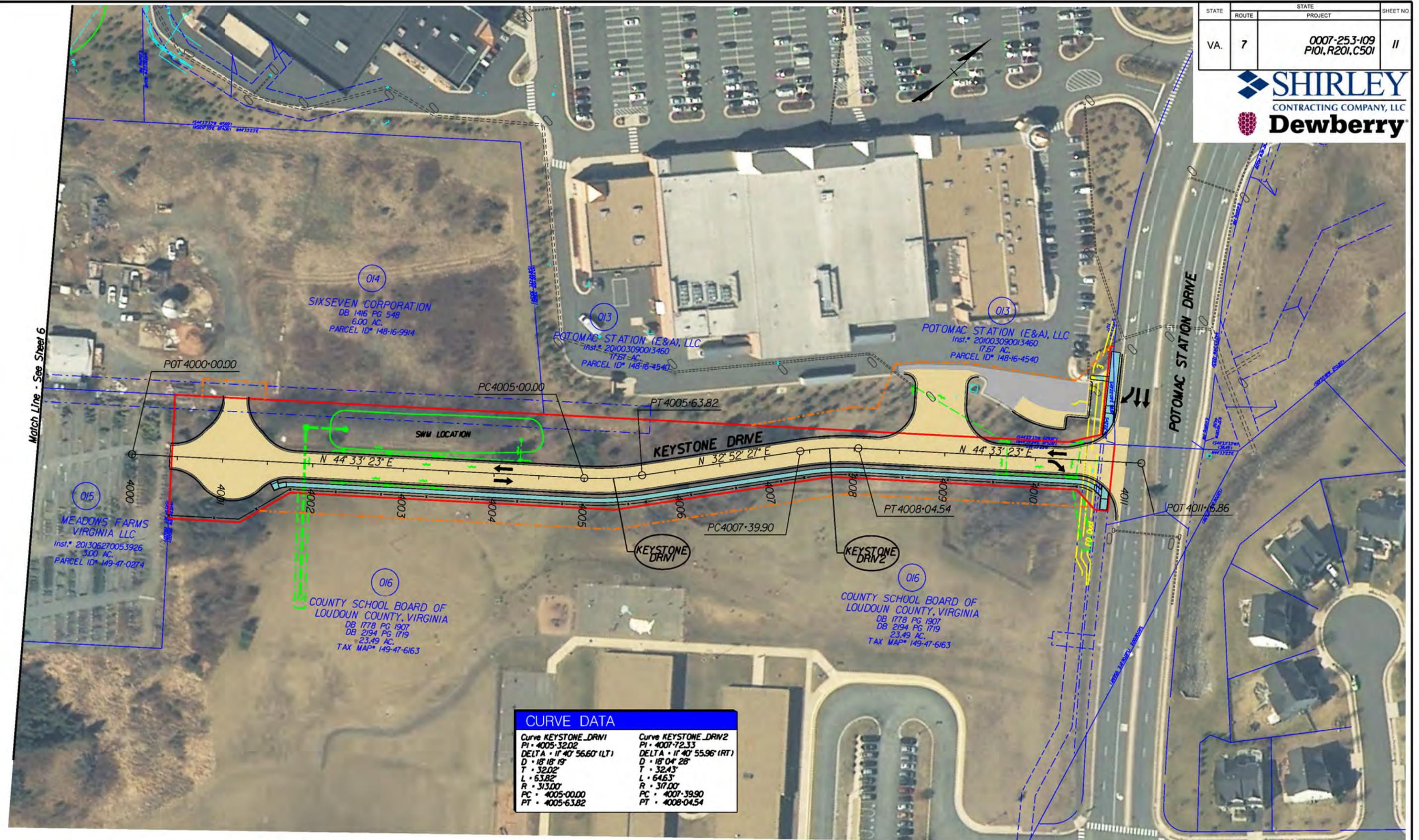


DESIGN ENHANCEMENT
Improved stormwater management concept reduces easement acquisition on parcel 011 and avoids relocation of the sanitary sewer

CURVE DATA	
Curve WEST_DRIVEWAY1	Curve WEST_DRIVEWAY2
PI • 3001-66.84	PI • 3013-63.55
DELTA • 77° 03' 10.94" (LT)	DELTA • 21° 26' 27.56" (LT)
D • 57' 11" 45"	D • 9' 32" 57"
T • 79.62'	T • 113.59'
L • 134.48'	L • 224.53'
R • 100.00'	R • 600.00'
PC • 3000-87.23	PC • 3012-49.96
PT • 3002-21.71	PT • 3014-74.49

- Proposed Mill & Overlay or Variable Depth Overlay
- Proposed Roadway Full Depth Pavement
- Proposed Shared Use Path
- Proposed Bridge
- Proposed Concrete Sidewalk, Median or Entrance Gutter
- Proposed Grass Median/Buffer/Planted Area
- Proposed Stormwater Management Facility
- Area of Fee Simple Right-Of-Way Reduction
- Area of Permanent Esm'l, Reduction
- Area of Temporary Esm'l, Reduction
- Proposed Fee Simple Right-of-Way per RFP
- Proposed Permanent Esm'l. per RFP
- Proposed Temporary Esm'l. per RFP
- Proposed Utility Relocations
- Existing Utility Designations per RFP
- Denotes Proposed Retaining Wall

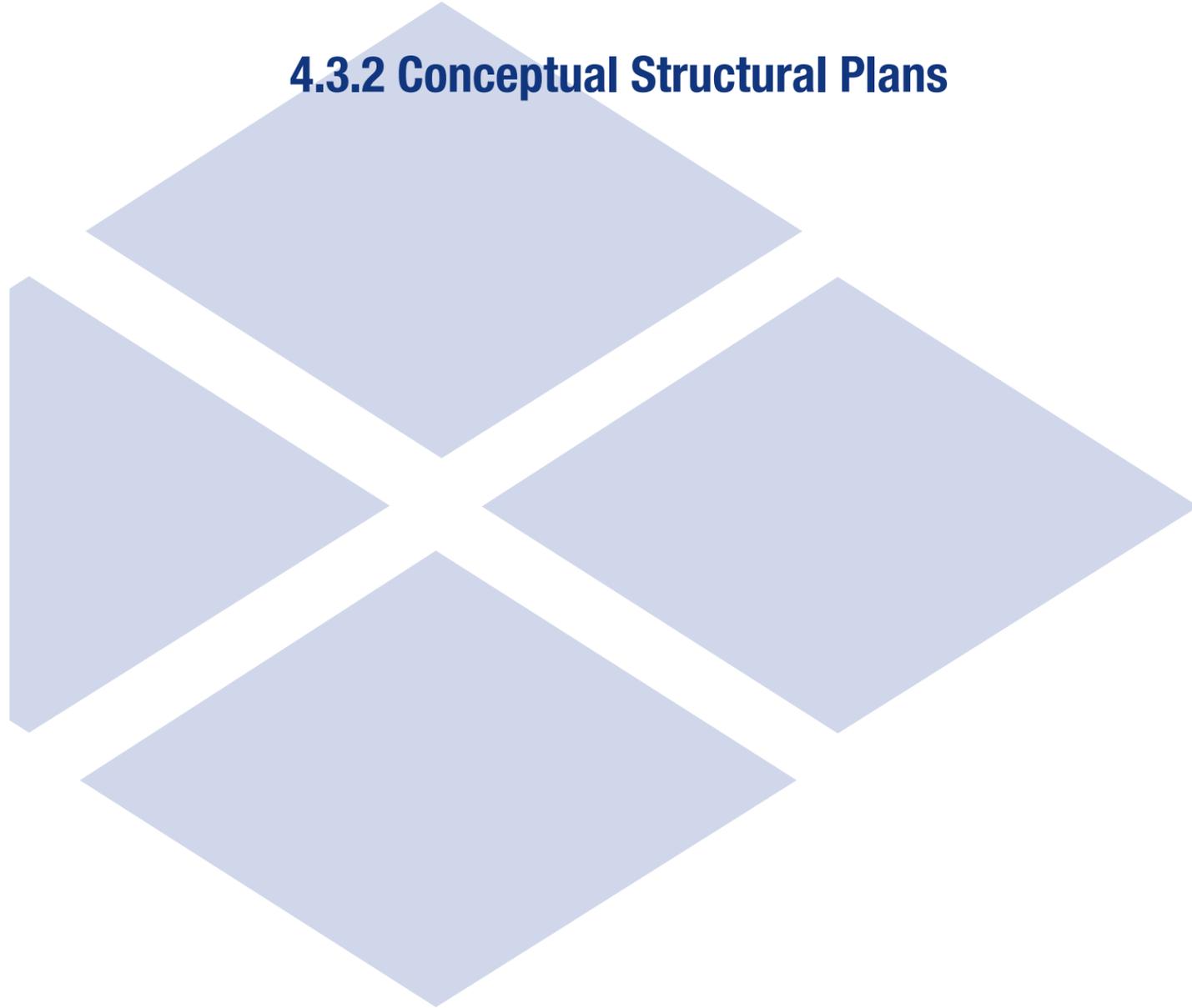
STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	7	0007-253-109 P101,R201,C501	11



CURVE DATA	
Curve KEYSTONE_DRV1 PI • 4005-32.02 DELTA • 17° 40' 56.60" (LT) D • 18' 18" 19" T • 32.02' L • 63.82' R • 313.00' PC • 4005-00.00 PT • 4005-63.82	Curve KEYSTONE_DRV2 PI • 4007-72.33 DELTA • 17° 40' 55.96" (RT) D • 18' 04" 28" T • 32.43' L • 64.63' R • 317.00' PC • 4007-39.90 PT • 4008-04.54

- Proposed Mill & Overlay or Variable Depth Overlay
- Proposed Roadway Full Depth Pavement
- Proposed Shared Use Path
- Proposed Bridge
- Proposed Concrete Sidewalk, Median or Entrance Gutter
- Proposed Gross Median/Buffer/Planted Area
- Proposed Stormwater Management Facility
- Area of Fee Simple Right-Of-Way Reduction
- Area of Permanent Esm'l, Reduction
- Area of Temporary Esm'l, Reduction
- Proposed Fee Simple Right-of-Way per RFP
- Proposed Permanent Esm'l, per RFP
- Proposed Temporary Esm'l, per RFP
- Proposed Utility Relocations
- Existing Utility Designations per RFP
- Denotes Proposed Retaining Wall

4.3.2 Conceptual Structural Plans



STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.	STP-5A0-1(704)	7	0007-253-109, B601
Federal Structure No. 00000000031105		FHWA Construction and Scour Code: X271-SN	
Federal Stewardship and Oversight Code: NFD		UPC No. 106573	

DESIGN EXCEPTION(S):
None.

GENERAL NOTES:
Widths: 6'-6" sidewalk, 124'-0" roadway, 17'-6" shared use path.
Overall width 158'-0" face-to-face of rails. Deck flares out at four corners.

Span layout: 92'-2" - 92'-2" continuous steel plate girder spans.
Capacity: HL-93 loading.

Specifications:
Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.

Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.

Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

Design loading includes 20 psf allowance for construction tolerances and construction methods.

Design loading includes 15 psf allowance for future wearing surface.

Face of all MSE walls shall receive architectural treatment.

All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for reinforcing steel noted as CRR (Corrosion Resistant Reinforcing) in accordance with IIM-S&B-81.

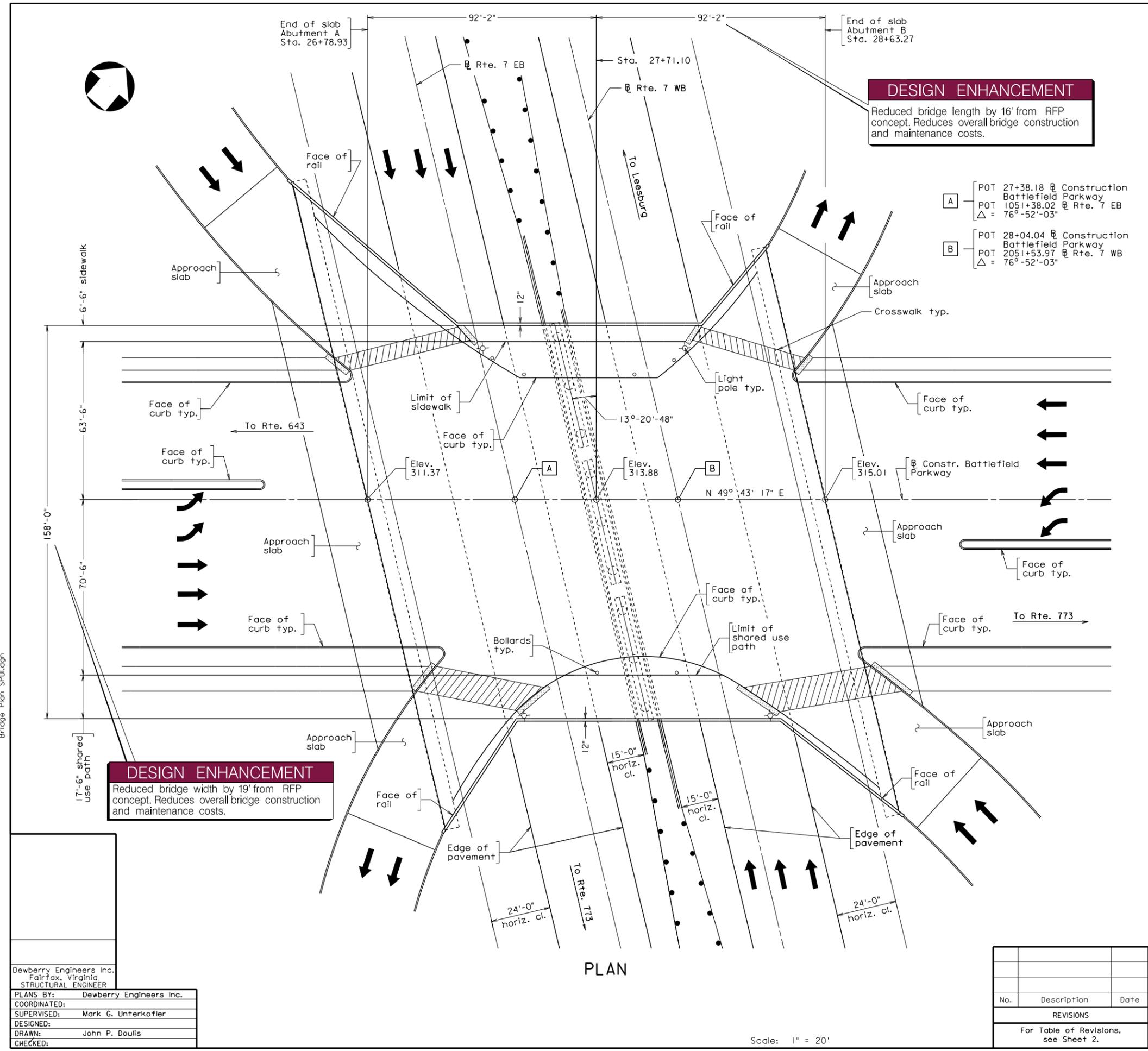


COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
PROPOSED BRIDGE ON
BATTLEFIELD PARKWAY OVER RTE. 7
TOWN OF LEESBURG - 0.9 MI. E.
OF RTE. 7/15 BYPASS
PROJ. 0007-253-109, B601

Recommended for Approval: _____
District Project Development Engineer Date

Approved: _____
District Administrator Date

Date: _____ © 2018, Commonwealth of Virginia Sheet 1 of 2



DESIGN ENHANCEMENT
Reduced bridge length by 16' from RFP concept. Reduces overall bridge construction and maintenance costs.

DESIGN ENHANCEMENT
Reduced bridge width by 19' from RFP concept. Reduces overall bridge construction and maintenance costs.

- A POT 27+38.18 @ Constr. Battlefield Parkway
POT 1051+38.02 @ Rte. 7 EB
Δ = 76°-52'-03"
- B POT 28+04.04 @ Constr. Battlefield Parkway
POT 2051+53.97 @ Rte. 7 WB
Δ = 76°-52'-03"

PLAN

Scale: 1" = 20'

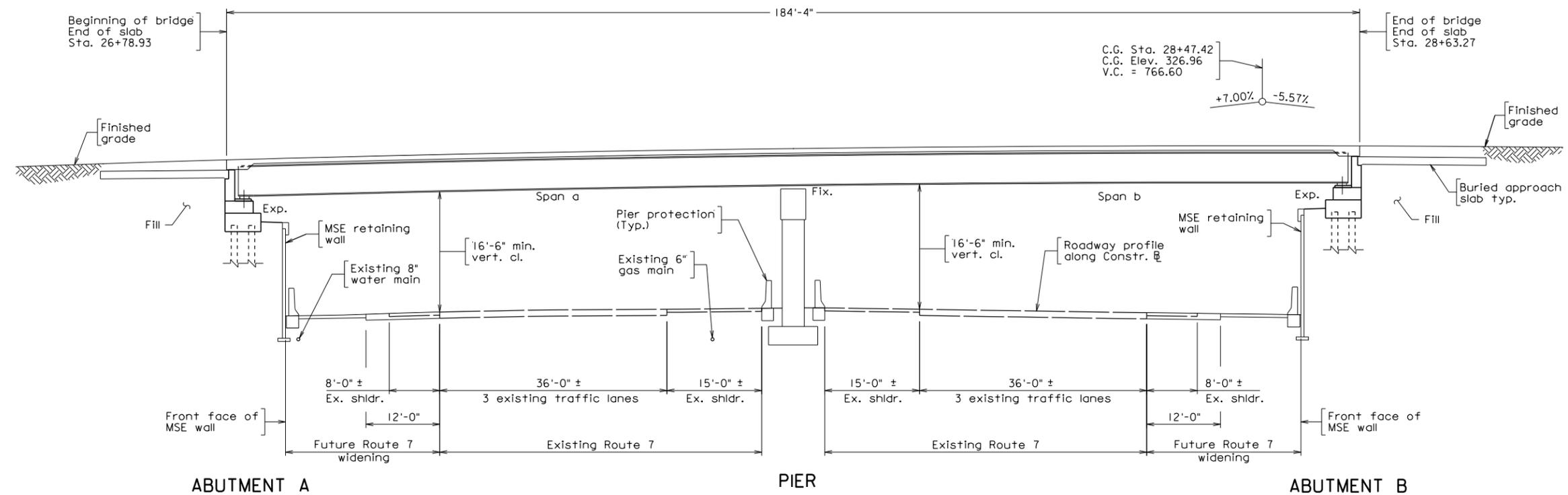
No.	Description	Date
REVISIONS		
For Table of Revisions, see Sheet 2.		

Bridge Plan_SPU1.dgn

Dewberry Engineers Inc. Fairfax, Virginia STRUCTURAL ENGINEER
PLANS BY: Dewberry Engineers Inc.
COORDINATED:
SUPERVISED: Mark G. Unterkofler
DESIGNED:
DRAWN: John P. Doulis
CHECKED:

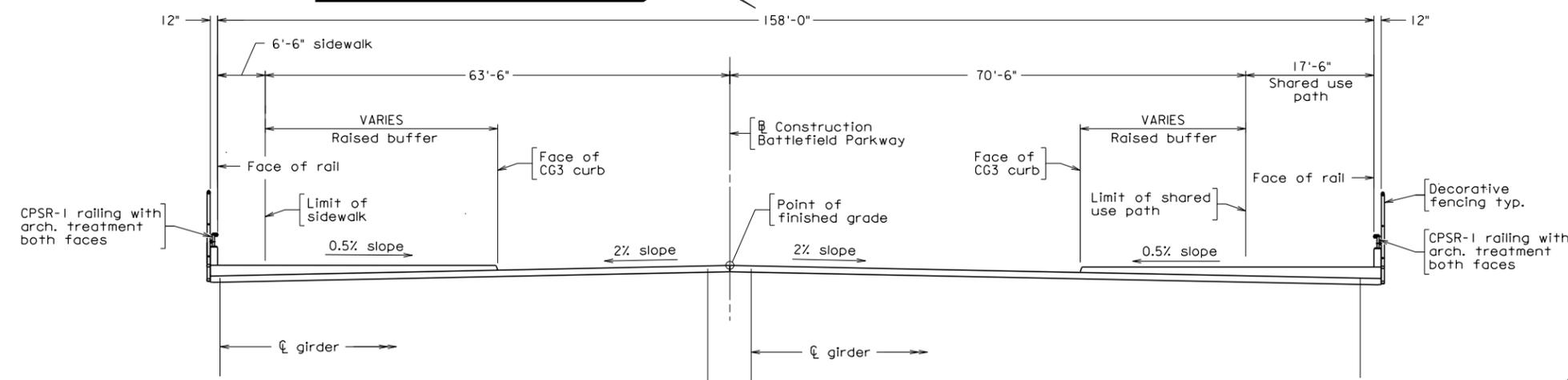
STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.	STP-5A0-1(704)	7	0007-253-109, B601
			2

DESIGN ENHANCEMENT
 Reduced bridge length by 16' from RFP concept. Reduces overall bridge construction and maintenance costs.



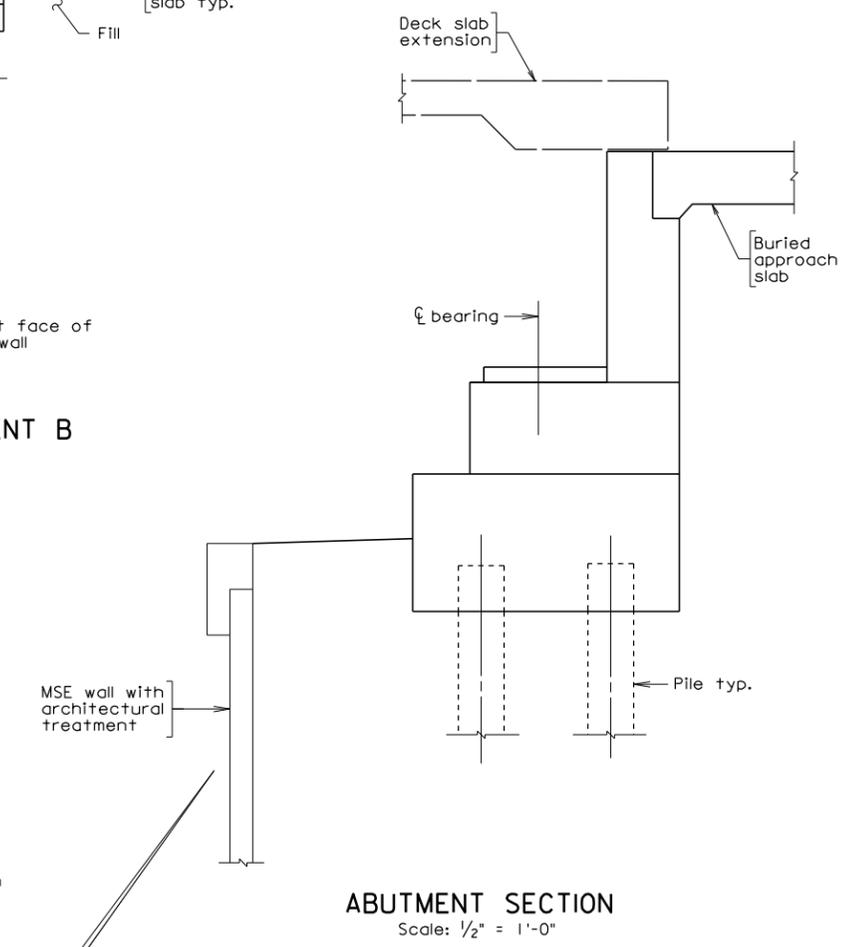
DESIGN ENHANCEMENT
 Reduced bridge width by 19' from RFP concept. Reduces overall bridge construction and maintenance costs.

DEVELOPED SECTION ALONG CONSTR. \mathcal{L}



TRANSVERSE SECTION (MINIMUM)

DESIGN ENHANCEMENT
 Utilize Corrosion Resistant Reinforcing in MSE panels. Reduces bridge maintenance costs.



ABUTMENT SECTION
 Scale: 1/2" = 1'-0"



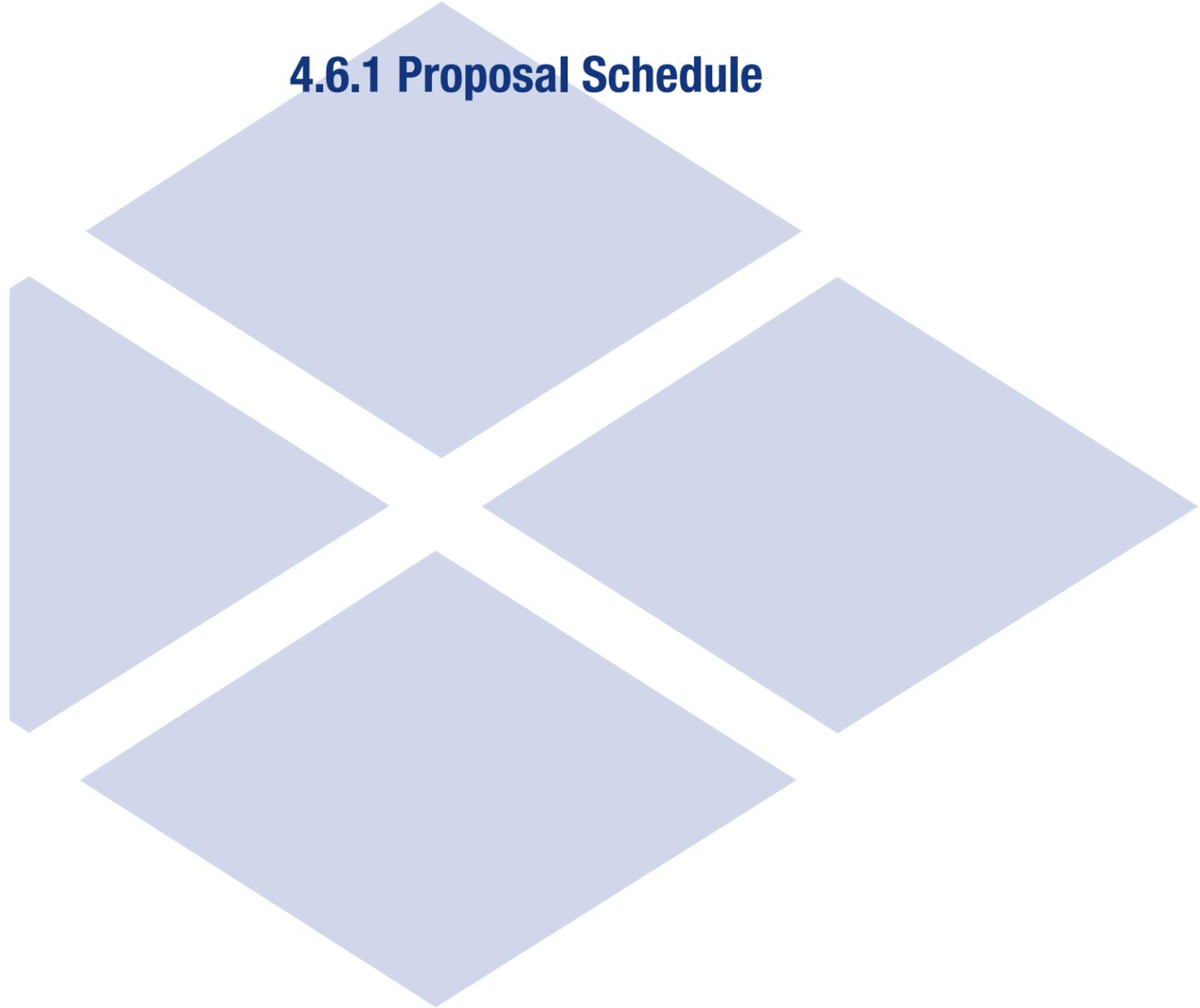
Dewberry Engineers Inc.
 Fairfax, Virginia
 STRUCTURAL ENGINEER

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
DEVELOPED SECTION, TRANSVERSE SECTION AND ABUTMENT CONFIGURATION				
No.	Description	Date	Designed: MGU	Sheet No.
			Drawn: JPP	2 of 2
			Checked: JPP	
Revisions			Date	Plan No.
			Oct 2018	301-85

Scale: 1" = 10' unless otherwise noted

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4.6.1 Proposal Schedule



Activity ID	Activity Name	Duration	Start	Finish	Total Float	2019												2020				2021				2022				2023											
						Q4				Q1				Q2				Q3				Q4				Q1				Q2				Q3				Q4			
						Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3				
2018-JRA321 Route 7 and Battlefield Parkway Interchange						748	20-Dec-18	30-Nov-21	0																																
2018-JRA321.A Milestones						748	20-Dec-18	30-Nov-21	0																																
MS-1000	Notice of Intent to Award	0	20-Dec-18*		0	◆ Notice of Intent to Award																																			
MS-1100	CTB Approval / Notice to Award	0	10-Jan-19*		0	◆ CTB Approval / Notice to Award																																			
MS-1200	Design-Build Contract Execution	5	20-Feb-19*		5	◆ Design-Build Contract Execution																																			
MS-1300	Notice to Proceed	0	22-Feb-19*		0	◆ Notice to Proceed																																			
MS-1325	Unique Milestone #1 - Detour Intersection Improvements	0		15-Jan-20*	0	◆ Unique Milestone #1 - Detour Intersection Improvements																																			
MS-1350	Unique Milestone #2 - Open West Driveway	0		23-Jun-20*	0	◆ Unique Milestone #2 - Open West Driveway																																			
MS-1375	Unique Milestone #3 - Open Keystone Drive	0		27-Aug-20*	0	◆ Unique Milestone #3 - Open Keystone Drive																																			
MS-1400	Start Battlefield Parkway Detour	0	18-Jul-20		2	◆ Start Battlefield Parkway Detour																																			
MS-1500	End Battlefield Parkway Detour - Open Interchange To Traffic	0		18-Jul-21*	0	◆ End Battlefield Parkway Detour - Open Interchange To Traffic																																			
MS-1550	Burn In Period for New Intersection/Signal - Battlefield and Rte. 7	60	19-Jul-21	16-Sep-21	15	■ Burn In Period for New Intersection/Signal - Battlefield																																			
MS-1600	Substantial Completion	0		01-Oct-21	0	◆ Substantial Completion																																			
MS-1610	Final Inspections & Punchlist	40	04-Oct-21	30-Nov-21	0	■ Final Inspections & Punchlist																																			
MS-3000	Final Completion	0		30-Nov-21*	0	◆ Final Completion																																			
2018-JRA321.A.1 Project Management						195	22-Feb-19	04-Sep-19	68																																
PM-1000	Scope Validation Period	120	22-Feb-19	21-Jun-19	68	■ Scope Validation Period																																			
PM-1020	Prepare/Submit Submittal Register	15	22-Feb-19	08-Mar-19	107	■ Prepare/Submit Submittal Register																																			
PM-1050	Prepare / Submit Preliminary Schedule	15	22-Feb-19	08-Mar-19	152	■ Prepare / Submit Preliminary Schedule																																			
PM-1100	VDOT Review / Approve Preliminary Schedule	21	09-Mar-19	29-Mar-19	152	■ VDOT Review / Approve Preliminary Schedule																																			
PM-1150	Prepare / Submit Baseline Schedule	90	22-Feb-19	22-May-19	77	■ Prepare / Submit Baseline Schedule																																			
PM-1200	VDOT Review / Approve Baseline Schedule	21	23-May-19	12-Jun-19	77	■ VDOT Review / Approve Baseline Schedule																																			
PM-1250	Prepare / Submit QA/QC Plan	45	09-Mar-19	22-Apr-19	107	■ Prepare / Submit QA/QC Plan																																			
PM-1300	VDOT Review / Approve QA/QC Plan	21	23-Apr-19	13-May-19	107	■ VDOT Review / Approve QA/QC Plan																																			
PM-1350	Prepare / Submit Health & Safety Plan	45	09-Mar-19	22-Apr-19	107	■ Prepare / Submit Health & Safety Plan																																			
PM-1400	VDOT Review / Approve Health Safety Plan	21	23-Apr-19	13-May-19	107	■ VDOT Review / Approve Health Safety Plan																																			
PM-1450	QA/QC Kickoff Meeting	0	22-Jun-19		68	◆ QA/QC Kickoff Meeting																																			
PM-1500	Preparatory Inspection Meetings for Initial Constr. Activities	15	22-Jun-19	06-Jul-19	68	■ Preparatory Inspection Meetings for Initial Constr. Activities																																			
PM-1550	Preparatory Inspection Meeting for Grade, Utilities, Roadway and Bridge Activities	30	07-Jul-19	05-Aug-19	68	■ Preparatory Inspection Meeting for Grade, Utilities, Roadway and Bridge Activities																																			
PM-1600	Preparatory Inspection Meetings for Misc. and Finish Activities	30	06-Aug-19	04-Sep-19	68	■ Preparatory Inspection Meetings for Misc. and Finish Activities																																			
2018-JRA321.B Design						183	21-Feb-19	07-Nov-19	2																																
DES-1000	Start Design	0	22-Feb-19*		0	◆ Start Design																																			
DES-1020	Submit Property Letters	15	22-Feb-19	08-Mar-19	0	■ Submit Property Letters																																			
DES-1050	Establish Survey Control / Aerial Mapping	25	21-Feb-19	27-Mar-19	0	■ Establish Survey Control / Aerial Mapping																																			
DES-1100	Utility Designations	20	22-Feb-19	21-Mar-19	0	■ Utility Designations																																			
DES-1120	Utility Test Pits	20	22-Mar-19	18-Apr-19	42	■ Utility Test Pits																																			
DES-1150	Layout for Soil Borings	5	28-Mar-19	03-Apr-19	0	■ Layout for Soil Borings																																			
DES-1250	Complete Soil Borings for GDR	25	04-Apr-19	08-May-19	0	■ Complete Soil Borings for GDR																																			
DES-1275	Geotechnical Lab Testing	25	09-May-19	13-Jun-19	0	■ Geotechnical Lab Testing																																			
DES-1300	Prepare / Submit GDR	20	14-Jun-19	12-Jul-19	0	■ Prepare / Submit GDR																																			
DES-1350	VDOT Review / Approve GDR	90	13-Jul-19	10-Oct-19	0	■ VDOT Review / Approve GDR																																			
DES-9900	Design Complete	0		07-Nov-19	2	◆ Design Complete																																			
2018-JRA321.B.1 Advanced Bridge Plan Set						105	28-Mar-19	23-Aug-19	55																																
DES-1200	Prepare Advanced Bridge Set Plans (1st Submission)	40	28-Mar-19	22-May-19	21	■ Prepare Advanced Bridge Set Plans (1st Submission)																																			
DES-1400	Design QA/QC Review / Constructability Review (1st Submission)	5	23-May-19	30-May-19	21	■ Design QA/QC Review / Constructability Review (1st Submission)																																			
DES-1450	Submit 1st Submission Plans - Advanced Bridge Set	0		30-May-19	21	◆ Submit 1st Submission Plans - Advanced Bridge Set																																			

■ Remaining Work ◆ Milestone
 ■ Critical Remaining Work



