

TECHNICAL PROPOSAL - VOLUME I

# I-81 WIDENING MM 221 TO MM 225 DESIGN-BUILD

AUGUSTA COUNTY, VIRGINIA



State Project No.: 0081-007-013, B638, B639, B640, B641, B642, C501, D602, D603, P101, R201  
Federal Project No.: NHPP-081-2(329)  
Contract ID Number: C00116269DB116



SUBMITTED ELECTRONICALLY  
JANUARY 20, 2023



# 4.1

## Letter of Submittal

January 20, 2023

Joseph A. Clarke, PE, DBIA  
Alternative Project Delivery Division  
Virginia Department of Transportation  
1401 East Broad Street  
Richmond, VA 23219



**RE: I-81 Widening MM 221 to MM 225 in Augusta County, Virginia, State Project No.: 0081-007-013, B638, B639, B640, B641, B642, C501, D602, D603, P101, R201, Federal Project No.: NHPP-081-2(329), Contract ID Number: C00116269DB116**

Dear Mr. Clarke,

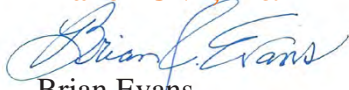
**Branch Civil, Inc. (Branch)**, as the Offeror, along with **Whitman Requardt & Associates, LLP (WRA)** as our Lead Designer, is pleased to submit our technical proposal for the I-81 Widening MM 221 to MM 225 Design-Build (the I-81 Project). Our proposal is organized in accordance with the RFP. Volume I includes our narrative, required forms, and appendices. Volume II consists of our Design Concept and Project Schedule. We have also included the Proposal Schedule in its native .XER file format and the two required layered PDF plots of the roadway and five bridges in plan view. The Branch-WRA team (the team) offers the following information as required by Section 4.1 of the Request for Proposals (RFP):

- **4.1.1 Offeror:** Branch, based at 3635 Peters Creek Road NW, Roanoke, VA 24019, is the Offeror and will be the overall authority on the I-81 Project as well as the Lead Contractor.
- **4.1.2 & 4.1.3 Declaration of Intent to Enter into a Contract:** Branch will enter into a contract with VDOT in accordance with the terms of the RFP and subsequent addenda. Further, the offer represented by our Technical and Price Proposals will remain in full force and effect for 120 days after the date that the Price Proposal is submitted.
- **4.1.4 Offeror's Point of Contact:** Donald E. Bryson, Jr., Pursuit Manager, 3635 Peters Creek Road NW, Roanoke, VA 24019, P: 704.572.1684, F: 540.982.4216, E: donald.bryson@branchcivil.com.
- **4.1.5 Principal Officer for the Offeror:** Brian Evans, Senior Vice President - Operations, 3635 Peters Creek Road NW, Roanoke, VA 24019, P: 757.420.1140, F: 540.982.4216, E: brian.evans@branchcivil.com
- **4.1.6 Final Completion Date:** Our team commits to a Final Completion Date of **June 8, 2027**.
- **4.1.7 Unique Milestones:** We do not propose unique milestone dates for the I-81 Project.
- **4.1.8 Proposal Payment Agreement or Waiver of Proposal Payment:** An executed Proposal Payment Agreement is included in *Appendix 9.3.1* of this document.
- **4.1.9 Certification Regarding Debarment Forms:** Signed Primary and Lower Tier Debarment Forms are provided in *Appendix 11.8.6*.
- **4.1.10 Disadvantaged Business Enterprise (DBE) Commitment:** Our team supports the DBE program and is committed to **achieving or exceeding** the six percent (6%) DBE participation goal for the entire value of the Contract.
- **4.1.11 Confirmation Statement:** We confirm that all commercial and professional registration requirements contained in our SOQ are complete and accurate. We also confirm that all members of our team remain in good standing with the applicable regulatory bodies and are eligible to provide the services required on the Project.

Our team acknowledges receipt of Addendum No. 1 dated November 8, 2022, Addendum No. 2 dated November 22, 2022, Addendum No. 3 dated December 20, 2022, and Addendum No. 4 dated January 13, 2023. The signed Acknowledgment of RFP, Revision and/or Addenda Form is provided in Appendix 3.7 of Volume I of our Technical Proposal. We appreciate the opportunity to present our proposal to VDOT and are 100% committed to delivering a successful, quality Project on-time and on-budget.

Sincerely,

**Branch Civil, Inc.**



Brian Evans  
Senior Vice President

# 4.2

## Offeror's Qualifications

# SECTION 4.2 OFFEROR'S QUALIFICATIONS

Our team comprises leading roadway and bridge designers and design-build (D-B) contractors who understand the I-81 Project's challenges and complexities, as well as VDOT's procedures and expectations. Our team members have solved similar challenges on past projects in the I-81 corridor and understand the importance of minimizing disruptions to local communities and the traveling public, with an emphasis on safety and the value of every dollar invested.

## SECTION 4.2.1: CONFIRMATION STATEMENT

Our team confirms that the information contained in our Statement of Qualifications (SOQ) remains true and accurate. To ensure that our team delivers the highest quality to the Department, the following team members have been added to the Quality Assurance (QA) team. Each will report directly to Quality Assurance Manager (QAM) **Ben Lineberry, Jr., PE**. Per Part 1, Section 11.4 of the RFP, **these changes were approved by VDOT on December 19, 2022.**

### Lead Roadway Quality Assurance Inspector **Matthew Coffin, CCM (Volkert)**

Matthew has over 15 years of experience on large, complex transportation projects. His experience includes leading construction management activities and inspection teams for state and municipal clients.

### Lead Structures Quality Assurance Inspector **Keith Maynard (Volkert)**

Keith has nearly 30 years of progressive bridge inspection experience in Virginia. He served as a VDOT Bridge Safety/Maintenance Inspection Team Leader for 19 years.

Matthew and Keith will be on the I-81 Project site full-time during the duration of the construction operations associated with their responsibilities. They will verify that all construction activities performed by the Design-Builder conform to the Contract requirements. Matthew and Keith will observe all QC activities to ensure inspection and testing and oversee approved corrective action for any non-conformities. They will be supported by and manage other QA inspectors and ensure that all construction operations and QC activities are observed. Each has all RFP mandated qualifications and certifications.

## Deputy Key Personnel

Our team is submitting the following personnel for the Deputy Key Personnel positions. Resumes for each are included in *Appendix 4.2.1*.

### Deputy Design-Build Project Manager (DDBPM) **Justin Campbell, PMP (Branch)**

Justin has 16 years of experience on large transportation construction projects. He is currently working alongside DBPM **Jim Kreider, PE** as the DDBPM on the I-95 Express Lanes Fredericksburg Extension (Fre-dEx) D-B in Stafford County, VA.

### Deputy Design Manager (DDM) **Andrew Koser, PE (WRA)**

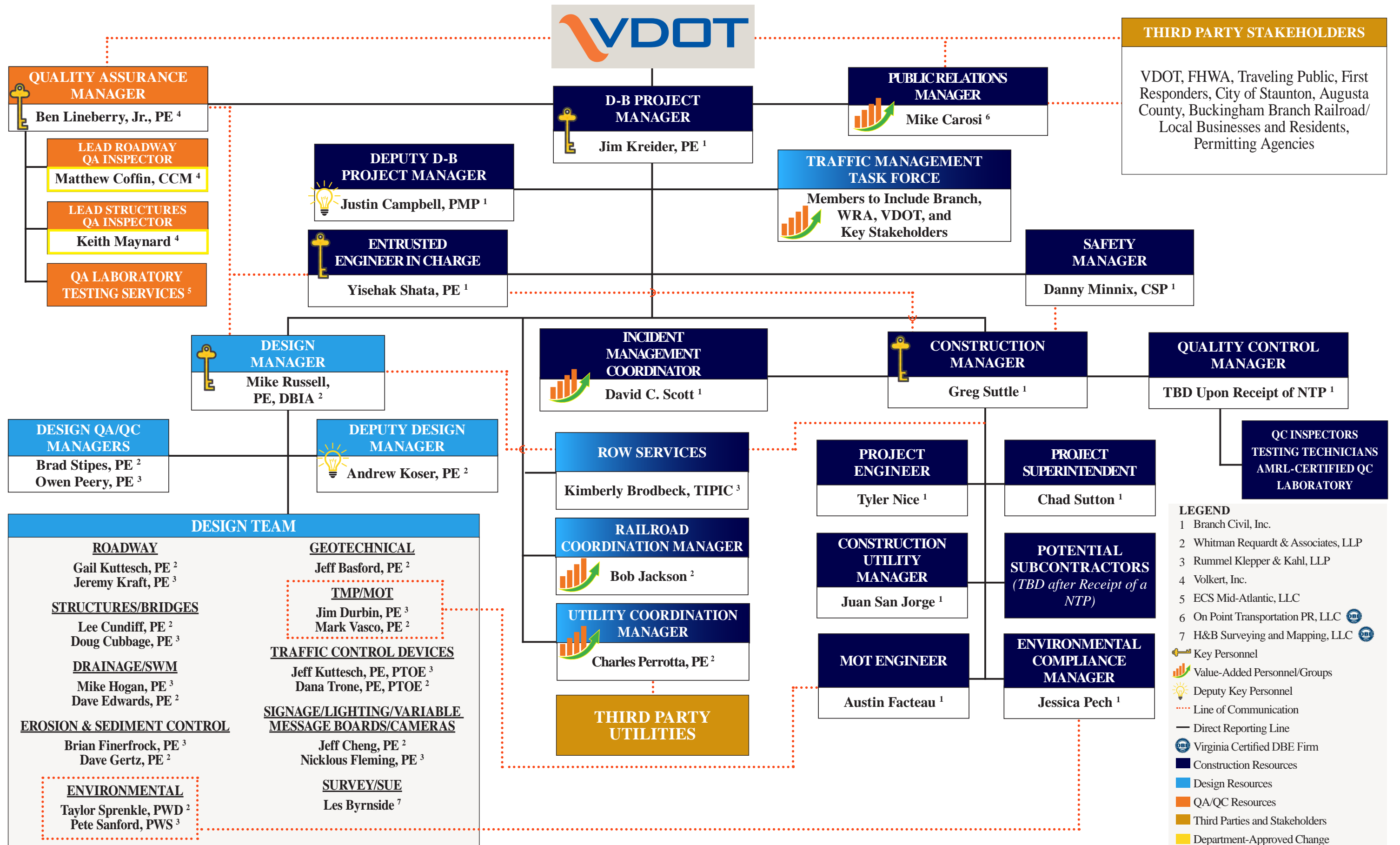
Andrew has over 19 years of managing and designing transportation projects in western Virginia. With experience working with Branch, Andrew is currently the Design Manager on the US Route 58 D-B in Patrick County, Virginia and was the Design Engineer on the I-64 Widening Exits 200 to 205 D-B in Henrico and New Kent County, Virginia. He was also the Lead Roadway Engineer and Assistant Design Manager for the I-81 Bridge Replacement Project of Route 11, Norfolk Southern Railroad, and the South Fork Holston River.

## SECTION 4.2.2: ORGANIZATIONAL CHART

Under the leadership of our Design-Build Project Manager (DBPM), **Jim Kreider, PE**, our team is structured to manage and deliver the design and construction of the I-81 Project. Jim will be ultimately responsible for the successful delivery of the I-81 Project and, as the single point of contact, responsible for all design and construction activities.

Our team's Organizational Chart, provided on the next page in **Figure 4.2.1**, is updated to reflect the addition of the Deputy Key Personnel, and Department-approved changes are highlighted in yellow. **As there are no other changes to functional relationships since the submittal of the SOQ, no further updates to the narrative are required.**

Figure 4.2-1: Organizational Chart



# 4.3

## Design Concept

# SECTION 4.3 DESIGN CONCEPT

Our team has highly effective communication protocols that ensure efficient development, approval, and ultimate implementation of a high-quality design. We have recent and relevant experience in the I-81 corridor that will allow rapid deployment and Project start-up. We have delivered similarly challenging projects for VDOT within budget and schedule and will successfully deliver the completion of the I-81 Project on June 8, 2027.

Our team has an established history of working together and brings unparalleled experience in the I-81 corridor. Our Design Concept, located behind "TAB 1" in Volume II, builds upon our overall design-build (D-B) and I-81 corridor experience to deliver VDOT and other stakeholders' best value. Key aspects and

enhancements are highlighted below in **Figure 4.3** and described throughout this section.

## SECTION 4.3.1.1: CONCEPTUAL ROADWAY PLANS

### 4.3.1.1(a): General Geometry

Our Design Concept, provided behind "TAB 1-A" in Volume II, provides three general purpose (GP) lanes with a graded median throughout the I-81 Project limits. Our Roadway Design Concept Plans include details for horizontal curve data, design speeds, the number and width of lanes and shoulders, superelevation meeting the TC-5.11R standard, and improvements to the ramps. Our Design Concept meets or exceeds the RFP requirements.

**Figure 4.3-1:** Summary of Conceptual Design Enhancements

DESIGN ENHANCEMENT DETAILS	PROJECT BENEFITS						
	SAFETY	OPERATIONS	SCHEDULE	CONSTRUCTABILITY	PUBLIC ACCEPTANCE	MAINTENANCE	COST SAVINGS
Our Design Concept balances earthwork and eliminates hauling surplus material off-site, <b>reducing truck traffic from the roadway by approximately 13,600 truck trips and limiting impacts to the traveling public.</b>	■	■	■	■	■		■
Our stormwater approach eliminates four linear best management practice (BMP) facilities, <b>reducing the total length of linear BMP facilities by over 70%, or approximately 2,600 linear feet (LF).</b> This enhancement will <b>reduce the Department's long term maintenance and inspection costs.</b>	■		■	■		■	■
Our team has optimized baselines to match the existing crown. Doing so <b>reduces slope correction,</b> and allows our team to <b>reset lane widths to 12 feet where they have been reduced over the years</b> due to repaving and re-striping during maintenance activities. This enhancement will <b>eliminate more than 2 miles of "±" finished lane width and provides VDOT 36 feet of full-depth pavement.</b>	■	■	■	■			■
Our Design Concept replaces the RFP Conceptual Design's 1,000-foot lane shift with a 75-MPH curve on NB I-81 near Route 262. This enhancement <b>provides a smoother and safer transition for drivers on this busy stretch of roadway.</b>	■	■			■		■
Improved hydraulics and stream stabilization are provided at the I-81 NB Lewis Creek bridge to <b>keep all substructure units out of the stream and provide long-term stream stabilization.</b> This enhancement also <b>improves the schedule by including natural stream restoration features, simplifying the permitting process.</b>			■	■		■	■
Our Design Concept maintains the existing auxiliary lanes at the NB on-ramp from Route 250 and NB off-ramp to Route 262 as an additional full-depth paved shoulder. This design enhancement <b>reduces costs for future I-81 widening projects and increases the safety of the traveling public.</b>	■	■			■	■	■
12-foot-wide travel lanes are provided during Phase 3 roadway construction operations for the length of the I-81 Project. This enhancement <b>provides increased safety for motorists in this high truck traffic area.</b>	■	■			■	■	
We have lengthened four overhead sign structures to eliminate 1200 LF of median guardrail. This enhancement <b>removes a hazard within the clear zone.</b>	■	■	■	■	■	■	■



The RFP Conceptual Design depicts median widening with the addition of a 12-foot travel lane adjacent to the existing lanes by widening parallel to the existing edge of the travel lane (as shown in the RFP). In areas where the proposed baseline matches the current RFP baseline, the Technical Requirements allow matching the existing lane widths. Throughout much of the I-81 Project, lane widths are nominally 12 feet wide. Sections exist where the two existing travel lanes measure 23 feet wide, including the 500 feet around NB Station (STA) 2143+00.

Our Design Concept will provide 12-foot lane widths along I-81 by widening parallel to the baseline instead of the existing lane line depicted in the survey as the edge of the pavement. **This enhancement will provide two 12-foot lanes to the median side of the roadway, thereby eliminating the narrower lane widths allowed by matching the current condition.** Doing so will require additional widening in the median. **Figure 4.3.1.1(a)** summarizes pertinent geometric features for the major roadway components and matches the Design Criteria provided in the RFP.

**Design Enhancement:**  
**General Geometry**  
*Our Design Concept provides VDOT with an enhanced design that resets all lane widths to 12 feet, where they have been reduced to as narrow as 11 feet over the years due to paving and re-striping.*

### 4.3.1.1(b): Horizontal Alignments

Our horizontal alignment closely mirrors the RFP Conceptual Design, which utilized a 2-foot-8-inch lane shift at the bridges over the railroad, Route 250, and Lewis Creek to allow the required structure widening to be done entirely to the median. However, we have optimized the baseline location and minimized crown shifts throughout the length of the I-81 Project to match the existing crown line better. Doing so reduces impacts associated with slope correction and accelerates the schedule. We analyzed the current information in the RFP Information Package and refined the proposed baseline to reestablish the centerline constructed in the 1960s.

I-81 baselines in our Design Concept are 2-inches to 5-inches closer to the crown than the RFP Conceptual Design. To accomplish this, our alignment also shifts the widening to the median in some places, increasing the width of the outside paved shoulder to eliminate the paved shoulder through those areas. The overall length of the 2-foot-8-inch lane shift at each bridge has been

**Figure 4.3.1.1-1(a): Geometric Features**

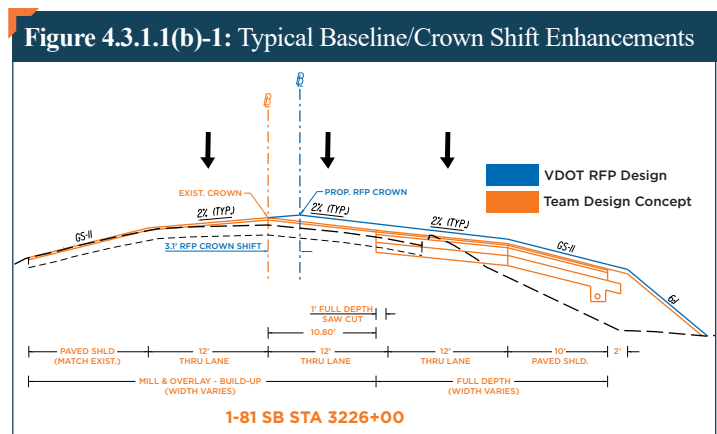
LOCATION	FUNCTIONAL CLASSIFICATION/ GEOMETRIC DESIGN STANDARD	DESIGN / POSTED SPEED (MPH)	NUMBER / WIDTH OF LANES
I-81 South of MM 224.26	GS-INT	70 / 65	Three (per direction) / 12' <sup>(3)</sup>
I-81 North of MM 224.6	GS-INT	75 / 70	Three (per direction) / 12' <sup>(3)</sup>
Ramp 1	GS-R	40 / N/A	Two / 12'
Route 250 Ramp A	GS-R	35 / N/A	One / 16'
Route 250 Ramps C & F	GS-R	35 / N/A	One / 18'
Route 250 Loop D	GS-R	25 / N/A	One / 18'
Route 262 Ramp A	GS-R	40 / N/A	One / 16'
Route 262 Ramp C	GS-R	45 / N/A	One / 16'

<sup>(3)</sup> Match existing lane widths when the horizontal location of the proposed and existing coincide.

reduced to minimize construction impacts related to cross slope correction; reduce schedule risk; improve temporary drainage; accelerate construction, and reduce driver impacts and exposure during construction. The most significant baseline changes exist at the following locations:

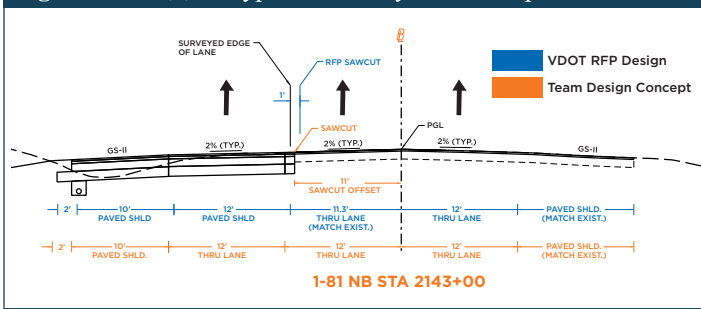
- SB STA 3027+00 to STA 3072+56.
- SB STA 3094+35 to STA 3121+22 (the slope correction work at Ramp No. 1 is also reduced).
- SB STA 3225+34 to STA 3233+81.

**Figure 4.3.1.1(b)-1** depicts a location where our Design Concept was modified to match the existing crown.





**Figure 4.3.1.1(d)-1: Typical Roadway Section Improvements**



**Design Enhancement:**  
**Roadway Typical Sections**  
*Our Design Concept balances earthwork and eliminates hauling surplus material off-site. This enhancement allows our team to reduce truck traffic from the roadway by approximately 13,600 truck trips.*

As required by the RFP, our team will obtain the cross slope and superelevation Design Waiver and/or Exception for all locations where Part 2, Section 2.2 allows matching the existing cross slope but doesn't meet VDOT or AASHTO requirements. We have analyzed the existing cross slopes and identified areas where slope correction will be required based on the criteria outlined in the RFP.

As noted previously in *Section 4.3.1(c)*, our team has refined the vertical alignment throughout the I-81 Project limits to reduce pavement build-up where possible. The current cross slope is utilized for much of the Project to minimize impacts and areas where variable depth overlays and runoff ponding impact temporary drainage patterns during construction. **This reduces the amount of variable depth overlay, reduces schedule risk, improves temporary drainage and driver safety, and reduces temporary lane closure impacts on motorists.**

Our Design Concept utilizes guardrail, barrier, or pier protection where required. Roadside grading will follow VDOT Standard CS-4B, as noted in the RFP Design Criteria Table. Existing slopes have been evaluated and will be improved as necessary to meet the RFP requirements. Where guardrail or barrier is required on I-81, the shoulder width is increased by 2 feet to maintain the usable shoulder width (12-foot minimum).

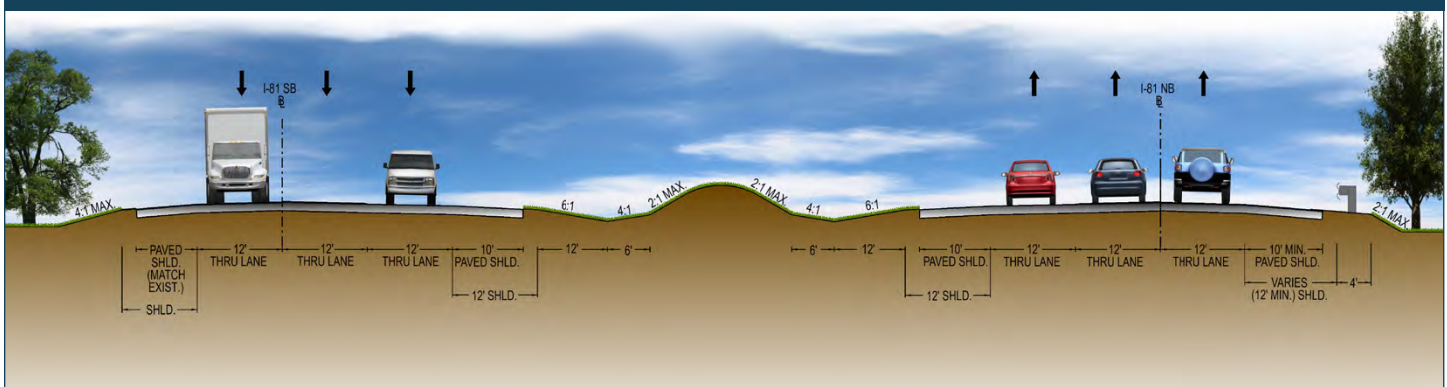
Our team evaluated the potential clear zone hazards along Route 250 and determined that GR-MGS1A can be installed in place of the Bridge Pier Protection System (BPPS) along the outside shoulder of WB Route 250 while still providing a 12-foot shoulder. This design change reduces cost and traffic impacts. The proposed grading within the median has been optimized to reduce the need for guardrail by maximizing the use of traversable slopes within the clear zone. **Figure 4.3.1.1(d)-2** below provides an example of our typical roadway section on the I-81 Project.

**RAMPS**

Typical sections for ramps are included in Volume II. Travel lane widths vary depending on the location and meet the requirements in the RFP Design Criteria Table. All ramps have a minimum 4-foot paved left shoulder, and 8-foot paved right shoulder. Ramp terminals/gores have been designed to incorporate the appropriate offsets, tapers, and crown rollover. Auxiliary lanes meet the requirements of the RFP.

Our team recognizes that a future project may widen I-81 north or south of the Project limits. When that occurs, the NB on-ramp from Route 250 and the NB off-ramp to Route 262 will be converted back to a parallel-style auxiliary lane. Our Design Concept maintains the existing auxiliary lanes at the NB on-ramp from Route 250 and NB off-ramp to Route 262 as an additional full-depth paved shoulder. This design enhancement reduces costs for future I-81 widening projects and increases the traveling public's safety.

**Figure 4.3.1.1-2(d)-2: Roadway Typical Section**



## RETAINING WALLS

Our Design Concept avoids retaining walls, eliminating future maintenance and any subsequent inspections that would be required. Our Design Concept maintains the existing soil nail wall along Augusta Woods Drive.

## STRUCTURES

Typical sections for the proposed bridge structures will conform to the VDOT *Manual of Structure and Bridge Division* and the RFP unless otherwise specified in approved Design Waivers or Exceptions.

### 4.3.1.1(e) Conceptual Hydraulic and Stormwater Management Design

Our SWM approach emphasizes feasibility and constructability to provide a solution that satisfies the requirements of VDOT and the Virginia Department of Environmental Quality (DEQ). Our team understands how to navigate the multiple layers of the DEQ's Virginia Stormwater Management Program (VSMP) regulations while engineering a proposed solution that minimizes costs and long-term maintenance requirements.

The ability to understand and meet the Project's SWM needs within the existing ROW while satisfying the design guidance of the RFP will be critical for the I-81 Project. We optimized and streamlined the SWM design while following VSMP regulations and guidance and meeting VDOT's Design Criteria. The following narrative provides examples of our approach to optimizing the RFP Conceptual Design, and **Figure 4.3.1.1(e)-1** compares our Design Concept with the RFP Conceptual Design.

**Figure 4.3.1.1(e)-1: SWM Approach Comparison**

BMP TYPE	RFP CONCEPTUAL DESIGN	DESIGN CONCEPT
Linear	5 each (Totaling 3,615 LF)	1 each (Totaling 1,015 LF)
Basin	8 each	8 each

### CONSOLIDATION OF DRAINAGE OUTFALLS TO MINIMIZE PERMANENT SWM FACILITIES

Our initial analysis of the RFP showed that some of the existing outfalls along I-81 were inadequate to convey the post-construction peak discharges. Our team will mitigate this condition by diverting runoff from the inadequate outfall through the median storm drain or channels to adequate outfalls or areas where the runoff can be sufficiently detained and treated by a BMP facility. Doing so will **protect VDOT from potential liability from downstream flooding impacts while providing the necessary on-site project water quality and quantity treatment and minimizing the**



## Design Enhancement:

### Stormwater Management

*Our stormwater approach eliminates four linear BMP facilities, reducing the total length of linear BMP facilities by over 70%, or approximately 2,600 linear feet. This enhancement will reduce the Department's long term maintenance and inspection costs.*

**number of permanent SWM facilities.** Our Design Concept includes:

- Diverting median runoff from:
  - » Existing 24-inch RCP outfall near SB STA. 3187
  - » The 24-inch metal pipe near NB STA. 2201
  - » The 42-inch RCP near NB STA 2207 and conveying the runoff to Lewis Creek, which is a FEMA 100-year floodplain that does not require stormwater quantity treatment.
- Diverting runoff from the existing 24-inch metal pipe near NB STA. 2227 and diverting to a proposed quality only treatment facility prior to out-falling to Lewis Creek

### STRATEGIC BMP TYPE SELECTION

Our team has carefully selected BMP types and locations to minimize the number of water quality and quantity BMPs on the I-81 Project, ultimately reducing long-term maintenance costs. Examples include:

- Maximizing nutrient credit purchase to satisfy up to 25% of the required Project water quality treatment.
- Utilizing BMP types with the benefits shown in **Figure 4.3.1.1(e)-2.**

**Figure 4.3.1.1(e)-2: BMP Design Benefits**

BMP TYPE	SWM BENEFITS	CONSTRUCTION/ MAINTENANCE BENEFITS
Filtering Practice (VA DEQ Spec. Practice 12)	<ul style="list-style-type: none"> <li>• High pollutant removal.</li> <li>• Provides significant detention volume above filter for adequate outfall compliance.</li> </ul>	<ul style="list-style-type: none"> <li>• Less filter material than bioretention.</li> <li>• Less planting requirements than bioretention.</li> <li>• Less median/ plantings to maintain than bioretention.</li> </ul>
Dry Swale (VA DEQ. Spec. Practice 10)	<ul style="list-style-type: none"> <li>• High pollutant removal.</li> <li>• Linear BMP type is a good fit for highway projects.</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed landscaping plan not required.</li> </ul>
Detention (Quantity treatment only)	<ul style="list-style-type: none"> <li>• Most efficient BMP for large quantity of peak flow reduction.</li> </ul>	<ul style="list-style-type: none"> <li>• No media or planting plan required.</li> </ul>

### ***SWM AT THE RAILROAD OUTFALL***

Our team understands from prior experience that discharging runoff from a project to a railroad right of way (ROW) requires a design that reduces peak storm event runoff discharges to at or below existing condition rates. For that reason, we have located a graded stormwater detention facility within the median just north/upstream of the Buckingham Branch Railroad (BBRR). This detention facility will provide sufficient runoff detention to reduce peak discharges from the roadway widening to at or below existing conditions, including up to the 100-year storm. **This approach will illustrate to the railroad that there will be no increase in runoff discharges and will ultimately facilitate the acquisition of easements and railroad permits needed for construction.**

### ***OPTIMIZING AREAS FOR EXCESS MATERIALS***

Our Design Concept optimizes the placement of surplus materials within the median. This minimizes the amount of material needed to be hauled away, resulting in safer construction operations. This method also eliminates the need for construction and long-term maintenance requirements from any MSE walls otherwise required to keep these areas as open channels.

Examples of how we will accomplish this include:

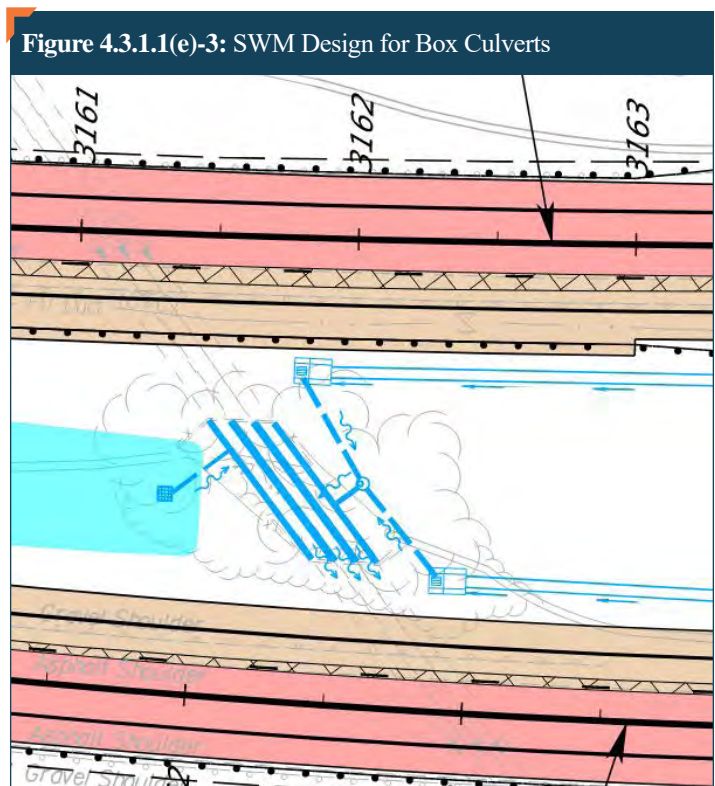
- Connecting the downstream end of the existing 48-inch concrete culvert at STA 2121+00 NB and the existing upstream end of the 5-foot x 5-foot box under STA 3122+00 SB.
- Connecting the existing triple 6-foot x 6-foot box culverts near STA 2163+00 NB/STA 3161+00 SB together, as demonstrated in **Figure 4.3.1.1(e)-3**.

### ***E&SC AND TEMPORARY DRAINAGE DESIGN***

Our team understands that DEQ has made inquiries statewide in recent years about confirming the protection of outfalls with sediment traps and basins per *DEQ Minimum Standard 6 (MS-6)*.

Our approach to a safe work zone and protecting downstream outfalls from sediment during construction includes the following:

- Utilizing all proposed BMP facilities as sediment traps and basins.
- Providing sediment traps within the I-81 median at key locations where the drainage area does not exceed 3 acres, equating to one sediment trap for every 2,000 LF of roadway.
- Implementing temporary drainage inlets along the concrete barriers used during MOT phases to ensure spread does not encroach greater than 1-foot into the



travel lanes during construction. We have performed preliminary MOT spread calculations to determine that inlets will be needed to meet this criteria.

- Utilizing VDOT Standard EC-15 slope interrupters on high fill slopes throughout the I-81 Project as required by the RFP.

### ***CONSTRUCTION SEQUENCING AND THE PROTECTION OF LEWIS CREEK***

The construction of the I-81 bridge piers and stream enhancement features at Lewis Creek will require a stream diversion plan to prevent sediment from the work area from entering the creek. The construction is anticipated to install new stream enhancement features needed to improve stream conditions within the area of the new bridge pier and new rock/riprap bank stabilization.

The following methods are typically used for this type of construction activity:

- Diverting the stream flow into temporary pipes.
- Diverting the flow away from construction activity through temporary open channels.

Open channels have the most remarkable conveyance capacity essential for a large stream system such as Lewis Creek (DA = 20 mi<sup>2</sup>). Temporary open channels reduce the risk of storm flows during construction activities while increasing workers' safety. This method also limits exposure of storm flow to unstable soils that could enter Lewis Creek.

Our team has designed multiple diversion types, including concrete traffic barriers and bin blocks, combined with a heavy poly-liner to create the geometry needed for maximum stream/storm flow conveyance. This technique has been used on many of our construction projects involving stream flow with great success.

#### 4.3.1.1(f) Proposed ROW Limits

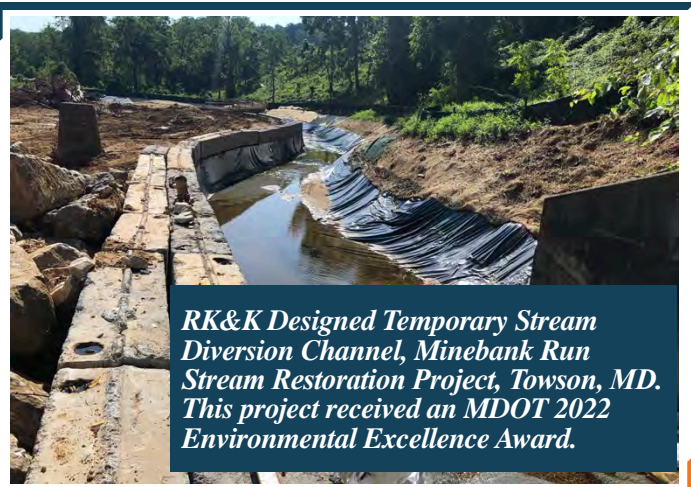
The RFP Conceptual Design does not depict any proposed work outside the existing ROW. Following the RFP, **our Design Concept is fully contained within those limits.** Permanent easements are provided at the BBRR to allow VDOT to maintain the structure and proposed drainage in the area. Our Design Concept is very similar to the RFP Conceptual Design in this area. We have improved the drainage layout, which requires a slight adjustment to the temporary construction easement and the permanent drainage easement in the median between the two structures. This drainage improvement will shift the rip-rap flume away from the proposed SB bridge widening and more closely center the flume within the median, providing improved long-term access for maintenance.

As provided in the RFP Information Package, VDOT has already performed considerable coordination with the railroad entities, BBRR, and the Virginia Passenger Rail Authority (VPRA). **Bob Jackson will serve as the team's proactive Railroad Coordinator and will build on VDOT's existing coordination with the railroad.** Bob will begin coordination confirming all aspects of the existing agreement between VDOT, BBRR, and the VPRA. Additional agreements, such as right of entry and insurance, will be expedited immediately upon NTP. Bob will proactively work through the iterative design and review process to gain ultimate plan approval. He will also facilitate RK&K's ROW acquisition efforts for the temporary and permanent easements from the railroad as necessary.



#### **Team Enhancement: Railroad Coordinator**

*Railroad Coordinator Bob Jackson is a former CSX Transportation employee with over 48 years of railroad agency experience and has coordinated and/or managed many railroad agreements on projects throughout Virginia, including those for BBRR. His in-depth understanding of securing construction agreements, right-of-entry agreements (pre-construction and construction), utility agreements (including agreements for drainage pipelines, when required), and roadway agreements will aid in preventing schedule delays.*



*RK&K Designed Temporary Stream Diversion Channel, Minebank Run Stream Restoration Project, Towson, MD. This project received an MDOT 2022 Environmental Excellence Award.*

#### 4.3.1.1(g) Proposed Utility Impacts

There are multiple utility impacts between the proposed construction and the existing utility facilities within the I-81 Project area. The most significant of these are existing fiber optic lines from Shentel's Telephone Cooperative within the I-81 median throughout the Project's length. There are also conflicts between the existing VDOT electric and new guardrails. Additional potential conflicts exist at several locations within the I-81 Project between proposed the SWM and existing water, sewer, gas, electric, and communications lines.

Our team assessed potential impacts and developed a strategy to address each, as summarized at the top of the next page in **Figure 4.3.1.1(g)**. Further discussion is provided in *Section 4.4.2*, and a detailed Utility Matrix is available behind "TAB 2" in Volume II.

#### 4.3.1.1(h) Noise Barrier Locations

Per the RFP requirements, we **do not currently propose noise barriers** in the I-81 Project corridor. A Final Design Noise Analysis will be performed in accordance with the RFP. Should the results dictate noise barriers are required, they will be included following the RFP.

#### 4.3.1.1(i) Other Key Project Features

##### **SIGNS IN THE I-81 PROJECT CORRIDOR**

Following the RFP, our team will replace all signage within the I-81 Project limits. We will provide an existing signing inventory and proposed actions for all current signs. Overhead advance guide and exit direction signage will be provided, meeting the requirements of the Federal Highway Administration (FHWA) *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)* and the Virginia Supplement to the MUTCD for the appropriate interchange classification. Overhead sign structures will be located outside the clear zone or protected by guardrail throughout the I-81 Project limits.

**Figure 4.3.1.1(g): Utility Conflicts and Our Potential Mitigation Strategies**

UTILITY / TYPE	APPROXIMATE LOCATION	POTENTIAL IMPACT	MITIGATION STRATEGIES
<b>Shentel</b> Telephone and Fiber Optic Lines	Throughout the entire I-81 Project. (the Utility Matrix shows record of Shentel planned relocate as no conflict).	Multiple conflicts with roadway widening and guardrail replacement.	Shentel pre-planned relocate along corridor. Coordinate to verify planned relocate does not conflict with roadway design.
<b>VDOT</b> Electric and Communications	Throughout the entire I-81 Project workzone.	Multiple conflicts with roadway widening and guardrail replacement.	Remove or relocate lines to avoid conflicts.
<b>City of Staunton</b> 10-inch Water	Along Route 250 at I-81 Bridge.	Possible conflict with guardrail replacement.	Protect during construction.
<b>Columbia Gas</b> 3-inch CSMP	Along Route 250 at I-81 Bridge	Possible conflict with guardrail replacement.	Protect during construction.
<b>Segra Fiber</b> Fiber Optic Lines	Along Route 250 at I-81 Bridge	Possible conflict with guardrail replacement.	Lower or relocate line to avoid conflict.
<b>Verizon</b> Copper 3.5-inch Iron Duct	Crossing I-81 at STA 3233+20.	Possible conflict with SWM.	Lower or relocate line to avoid conflict.
<b>Augusta County Service Authority</b> 16-inch Sewer	Crossing I-81 at STA 3078+30.	Possible conflict with SWM	Protect during construction.
<b>Augusta County Service Authority</b> 30-inch sewer	Crossing I-81 at STA 3218+85.	Possible conflict with SWM	Protect during construction.
<b>Columbia Gas</b> 10-inch HP Main	Crossing I-81 at STA 3128+05.	Possible conflict with roadway widening.	Protect during construction.
<b>Buckingham Branch Railroad</b> Electrical	Parallel to Augusta Woods Drive at STA 4003+18.	Possible conflict with bridge pier.	Remove, relocate or temporarily support.

Our team has identified four overhead signs where the foundation placed in the median must be protected with guardrail at the edge of the paved shoulder. With our approach to providing traversable slopes within the median, our Design Concept extends the length of four overhead sign structures so that the foundation is outside the 30-foot clear zone. This enhancement will not only remove 1,200 LF of guardrail within the clear zone that may be struck by vehicles but also reduce VDOT's future maintenance needs. These signs are located at STA 3065+00, STA 2068+00 NB, STA 3100+75 SB, and STA 3127+00 SB.

Because the Visual Complexity Rating of these environs is a maximum of three and based on the requirements of IIM-TE-380.1, we do not anticipate a need for sign lighting on overhead sign structures. Per the RFP, supplemental guide signs, Integrated Directional Signing Program (IDSP) signage, and regulatory/warning signage will be ground-mounted on appropriate VDOT standard sign structures. The proposed signing plan will provide motorists with clear guidance and notice of regulatory and advisory conditions within the I-81 Project area.

Our signing design differs from the RFP Conceptual Design supplemental information exhibits, SB approaching the US 250 exit. In the Supplemental Information

Package, signage is introduced for Exit 221 (I-64 East) with the 1¼ mile advance guide for Exit 222, is dropped at the ½ mile advance guide for Exit 222, and is shown again at the exit direction for Exit 222.

Our team believes that a clearer, more consistent sequence introduces the signage for Exit 221 on the ½ mile advance guide and continues to show it in the exit direction for Exit 222. In doing so, we propose to ground-mount the 1¼ mile advance guide sign and convert the ½ mile advance guide sign to a full-span sign structure. Finally, at the exit direction signage for Exit 222, the Supplemental Information Package did not replace the pull-thru sign for I-81 South/I-64 West. Our team proposes to replace this sign in kind to provide positive guidance to motorists staying on I-81.

We will design pavement markings to satisfy the VDOT PM standards. All permanent markings will be Type B Class VI to conform with VDOT requirements for limited access facilities. Plastic Inlaid Markers (PIMs) will be included in the Pavement Markings/Signage Plans per the appropriate VDOT standards. We will also maintain all existing intelligent transportation system (ITS) assets, except continuous count stations, per the RFP. Our team has identified these assets and plans to relocate them during construction to maintain their operation.

### **CLOSED-CIRCUIT TELEVISION (CCTV)**

Our team will coordinate with VDOT and install temporary portable CCTV camera trailers before decommissioning any existing CCTV cameras impacted by the I-81 Project. We will install the new CCTV camera to maintain continuous coverage.

### **Summary of Roadway Design Benefits**

Our team has extensive design experience for interstate roadways that meet or exceed VDOT's commitment to safe, high-quality, long-term, low-maintenance facilities. We understand the importance of incorporating constructability into designs and providing a Final Design that exceeds VDOT's expectations and requirements. Through our successful design and construction history with VDOT, we provide complete confidence in the I-81 Project's long-term asset performance and durability.

### **SECTION 4.3.1.2: CONCEPTUAL STRUCTURE PLANS**

Our approach to the I-81 Project provides a solution that meets or exceeds the RFP requirements. Using reliable and durable materials will result in safe operations, reduced long-term maintenance, increased long-term asset performance, improved constructability, and public acceptance. Conceptual Structure Plans are provided in Volume II behind "TAB1-B," and additional information follows in this section.

### **Bridge Superstructures**

#### **GENERAL BRIDGE DESIGN**

Our team is committed to a quality Project through communication, design, detailing, and installation. All materials used will be in strict accordance with the Department's design guidelines, specifications, RFP requirements, and approved materials lists. We will not use details that increase inspection frequency or require additional effort beyond routine bridge safety inspections. Besides providing safe, long-term, low-maintenance structures, our overall approach and proposed bridge designs will minimize impact to the public and allow construction in a safe and timely manner.

We will design the proposed bridge structure widenings, modifications, and repairs per the *AASHTO LRFD Bridge Design Specifications, 8th Edition and VDOT Modifications (IIM-S&B-80)*, the RFP requirements (including additional foundation criteria), and *Instructional and Informational Memoranda and the Manual of the Structure and Bridge Division*. Structures will be rated load-rated per IIM-S&B-86 and the RFP requirements.

### **CONSTRUCTABILITY THROUGH DESIGN**

Our team collaborated to extensively evaluate the constructability of the bridge modifications/repairs from a corridor perspective. We reviewed As-Built drawings, survey data, and various alternative roadway alignments to determine the Project's most efficient construction schemes. Our proposed sequence minimizes impacts to the traveling public and provides for each structure's shortest construction duration. Traffic will be temporarily shifted to 11-foot lanes with 1-foot minimum shoulders at the bridges per the RFP to facilitate construction and minimize phases of work and the number of construction joints in the deck. Our Structure Plans, provided in "TAB 1-B," show where greater temporary shoulder widths are provided. We will seek additional opportunities to increase the temporary travel way.

### **LOW MAINTENANCE STRUCTURES**

We evaluated VDOT design criteria, including existing span lengths, existing skew, geotechnical requirements, and available geotechnical information. Our findings indicate that deck joint eliminations using flexible link slabs at piers and deck slab extensions at the abutments are the best jointless bridge alternatives to reuse the existing beams/girders. The reinforced cast-in-place (CIP) concrete deck slabs will be constructed with Lightweight Low Shrinkage Class A4 Modified concrete and will contain corrosion-resistant reinforcing (CRR) steel as required by VDOT and the RFP requirements. We will build the deck to strictly adhere to VDOT concrete cover requirements, including the additional ½-inch of cover required by the RFP. The resulting deck provides a durable long-term low maintenance deck with a high-quality ride surface for the traveling public.

Based on available pH and soil resistivity soil test data included in the GDR, there is a potential for pile foundations to be exposed to corrosive conditions. Upon performing sulfate and chloride testing, steel piles will be sized to account for any corrosive conditions in accordance with VDOT requirements (*Manual of the Structure and Bridge Division, Part 2, Chapter 23.05*).

### **COMMITMENT TO QUALITY**

Our team is committed to producing a high-quality and cost-effective final product that will provide long-term, low-maintenance structures for the Department. This process began very early in the RFP phase through collaborative evaluation of many aspects of the structures, including small details that we know have been problematic for the Department and resulted in preventable maintenance issues.



## I-81 SB over Ramp 1

### STRUCTURE LAYOUT

After carefully considering the site conditions, our team determined that widening the existing three-span structure and replacing the bridge deck is the best option at this location. We will widen the structure to the inside in two construction phases. The Design Exceptions for shoulder width and modified parapet provided in the RFP in draft format will be pursued to facilitate adding a SB lane between the existing piers of the I-64 WB to I-81 SB Flyover bridge. The proposed bridge offers more than the required 16-foot-6-inch minimum vertical clearance.

### CONSTRUCTABILITY THROUGH DESIGN

- **Phase 1:** Perform concrete substructure repairs.
- **Phase 2:** To safely maintain traffic in two thru lanes, traffic will be temporarily shifted to the outside. The interior overhang and portion of deck over the two beams towards the median (beams 5 and 6) will be removed. The new portion of the substructure will be installed, two new beamlines utilizing plate girders will be set, existing bearings below beams five and six will be replaced, and the Phase 2 portion of the deck will be cast.
- **Phase 3:** Traffic will be temporarily shifted to the inside on the newly constructed deck to safely maintain traffic in two thru lanes. The remaining portion of the existing deck will be removed, the remaining existing bearings will be replaced, the Phase 3 portion of the deck will be cast, and a longitudinal closure pour performed.

### SUBSTRUCTURE

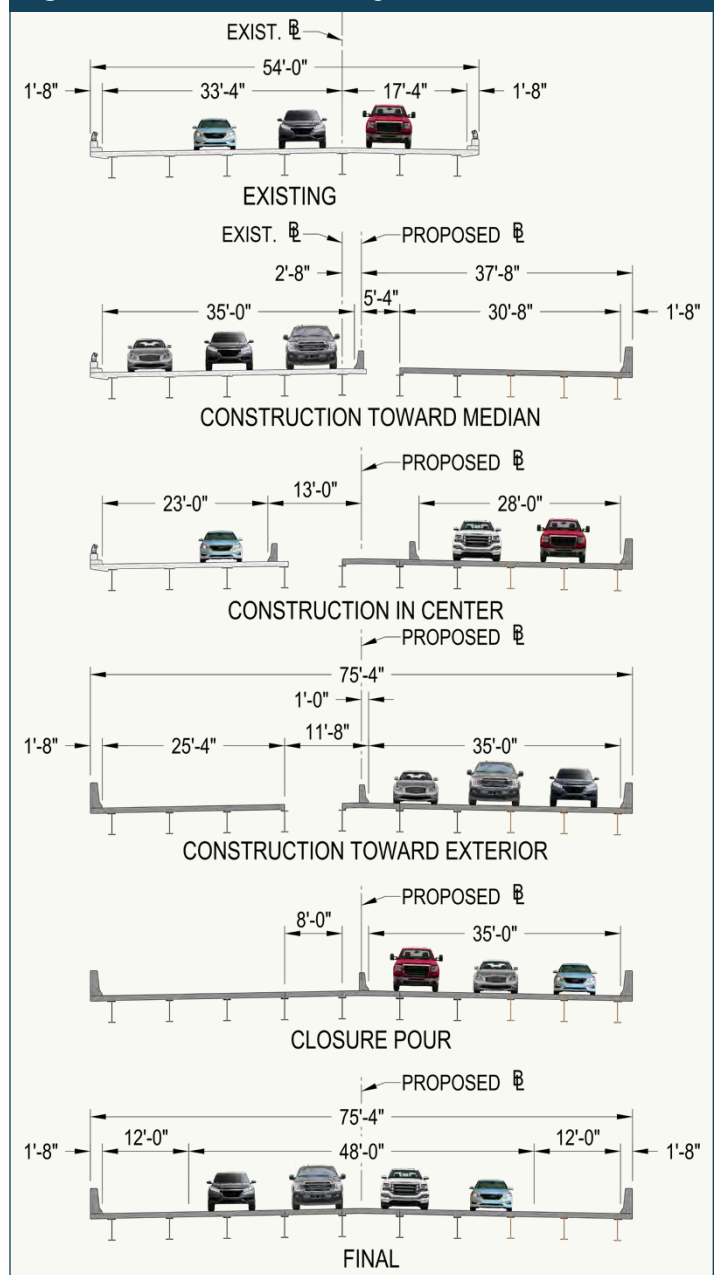
Existing abutment backwalls will be modified to accept the deck slab extension and support of buried approach slabs. Abutments will be extended in line with existing abutments, and free-standing piers will be added in line with the existing piers. Based on available information, we propose using HP piles for the abutment extensions and spread foundations for the piers.

## I-81 SB over Augusta Woods Drive/BBRR

### STRUCTURE LAYOUT

After reviewing site conditions, our team determined that widening the existing three-span structure and replacing the bridge deck is the best option at this location. The structure will be widened to the inside in three phases of construction. Details of construction activities are outlined above in **Figure 4.3.1.2-1**. The proposed bridge offers more than the required 16-foot-6-inch minimum vertical clearance over Augusta Woods Drive and maintains the existing vertical clearance over the BBRR. The

Figure 4.3.1.2-1: I-81 SB over Augusta Woods Drive and BBRR



vertical clearance will be maintained by utilizing steel-plate girders that are shallower than the existing beams but are designed to provide similar stiffness to existing beams and meet AASHTO span-to-depth ratios.

### CONSTRUCTABILITY THROUGH DESIGN

- **Phase 1:** Perform concrete substructure repairs.
- **Phase 2:** Traffic will be temporarily shifted to the outside to safely maintain traffic in one ramp lane and two thru lanes. The interior overhang and portion of deck over the two beams towards the median (beams 6 and 7) will be removed, a new portion of the substructure installed, three new beamlines utilizing plate girders set, existing bearings below beam lines 6 and 7 replaced, and Phase 2 portion of the deck cast.

- **Phase 3A:** Traffic will be temporarily shifted to the inside on the newly constructed deck to safely maintain traffic in two thru lanes, while maintaining the on-ramp movement to the outside in one lane. The remaining portion of the existing deck over beam lines 4 and 5 will be removed, existing bearings below beam lines 4 and 5 replaced, and Phase 3A portion of the deck cast.
- **Phase 3B:** On-ramp traffic will be temporarily shifted to the inside with mainline traffic on the newly constructed deck to safely maintain traffic in three lanes. The remaining portion of the existing deck will be removed, the remaining bearings replaced, and the Phase 3B portion of the deck cast and a longitudinal closure pour performed. This sequence reduces the number of longitudinal construction joints as compared to the RFP Conceptual Design.

### **SUBSTRUCTURE**

Existing abutment backwalls will be modified to accept the deck slab extension and support of buried approach slabs. Abutments will be extended in line with existing abutments, and free-standing piers will be added in line with the existing piers. Based on available information, we propose using HP piles for the abutment extensions and spread foundations for the piers.

## **I-81 SB over Route 250**

### **STRUCTURE LAYOUT**

Our team determined that widening the existing four-span structure and replacing the bridge deck would be the best option at this location. The structure will be widened to the inside in two phases of construction. The proposed bridge offers more than the required 16-foot-6-inch minimum vertical clearance.

### **CONSTRUCTABILITY THROUGH DESIGN**

- **Phase 1:** Perform concrete substructure repairs.
- **Phase 2:** Traffic will be temporarily shifted to the outside to safely maintain traffic in two thru lanes. The interior overhang and portion of the deck over the two beams towards the median (beams five and six) will be removed, a new portion of substructure installed, three new beamlines utilizing plate girders set, existing bearings below beams 5 and 6 replaced, and Phase 2 portion of the deck cast.
- **Phase 3:** Traffic will be temporarily shifted to the inside on the newly constructed deck to safely maintain traffic in two thru lanes. The remaining portion of the existing deck will be removed, remaining existing bearings replaced, the Phase 3 portion of the deck cast, and longitudinal closure pour performed.

### **SUBSTRUCTURE**

Existing abutment backwalls will be modified to accept the deck slab extension and support of buried approach slabs. Abutments will be extended in line with existing abutments, and free-standing piers will be added in line with the existing piers. Based on available information, we propose using HP piles for the abutment extensions and a mix of spread and pile foundations for the piers.

## **I-81 SB and I-81 NB over Lewis Creek**

### **STRUCTURE LAYOUT**

Our team determined that widening the existing three-span structures and replacing the bridge decks is the best option at this location. The structure will be widened to the inside in two phases of construction. The proposed bridge will not reduce the current hydraulic opening. Based on a review of the RFP Conceptual Design, Lewis Creek has shifted its alignment over time due to high bank erosion to the point that these flows threaten utilities, and the proposed widened portion of Pier 2 would be located fully in Lewis Creek.

Our Design Concept includes the installation of riprap to protect the Lewis Creek stream bank, as specified in the RFP. It also consists of installing cross-vanes and J-hook structures to reestablish the original stream alignment between piers on each bank. See our Roadway Plans, located behind "TAB 1-A" in Volume II, for the location and details of these features.

Based on review of the existing drawings and reports, the existing bearings are 3/4-inch neoprene pads. A new reinforced bearing pad meeting current design standards is thicker. We propose to raise the bridge and approaches slightly to accommodate the new bearings. This will be done in each phase while portion of structure is not exposed to live load.

Details of construction activities for the I-81 SB/NB structures over Lewis Creek are outlined on the next page in **Figure 4.3.1.2-2**.

### **CONSTRUCTABILITY THROUGH DESIGN**

- **Phase 1:** Perform concrete substructure repairs.
- **Phase 2:** Traffic will be temporarily shifted to the outside to safely maintain traffic in two thru lanes. The interior overhang and portion of the deck over



#### **Design Enhancement:**

#### **Structures - I-81 SB/NB over Lewis Creek**

*Our Design Concept mitigates high stream velocities from eroding stream banks and provides a long-term solution for asset protection in managing stream flows and bank stability.*

the two beams towards the median (SB - beams 8 and 9, NB – beams 1 and 2) will be removed, a new portion of substructure installed, four new beam lines set, existing bearings below beam lines where the deck has been removed replaced, and the Phase 2 portion of the deck cast.

- **Phase 3:** Traffic will be temporarily shifted to the inside on the newly constructed deck to safely maintain traffic in two thru lanes. The remaining portion of the existing deck will be removed, remaining existing bearings replaced, the Phase 3 portion of the deck cast, and a longitudinal closure pour performed.

### SUBSTRUCTURE

Existing abutment backwalls will be modified to accept the deck slab extension and support of buried approach slabs. Abutments will be extended in line with existing abutments, and free-standing piers will be added in line with the existing piers. Based on available information, we propose using HP piles for the abutment extensions and spread foundations for the piers.

### Retaining Walls

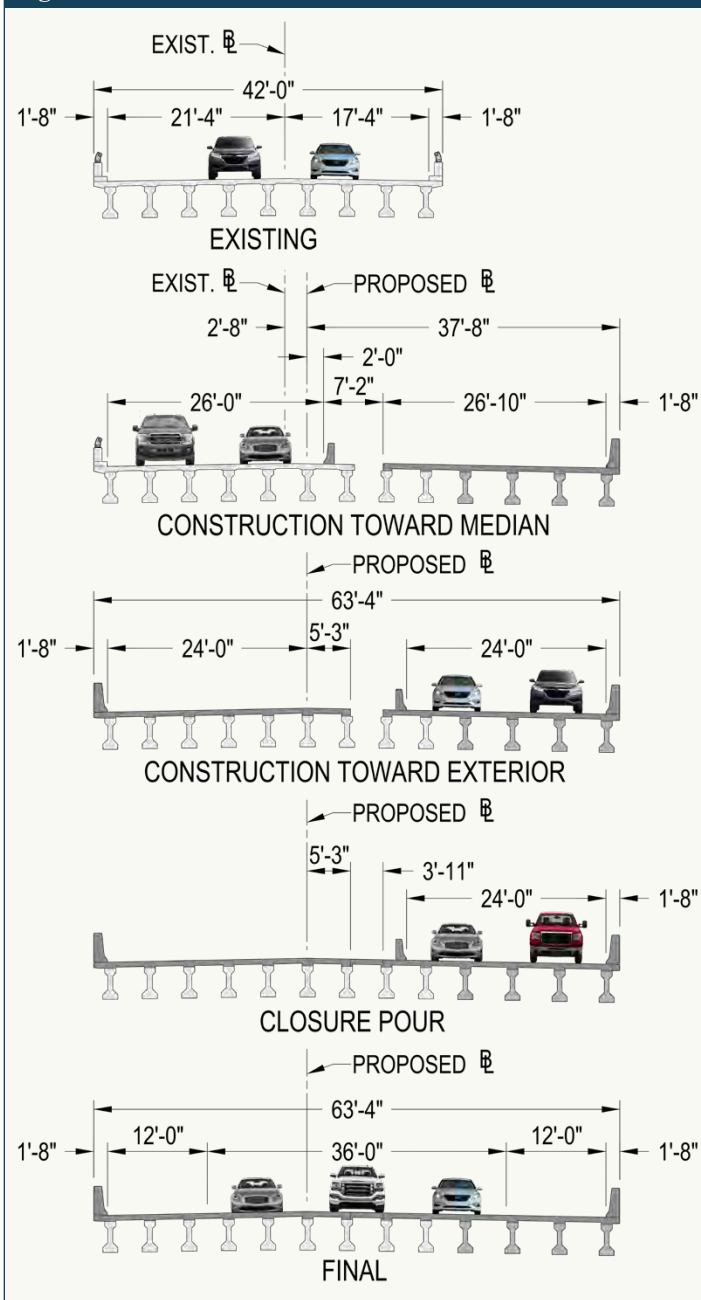
The existing soil nail retaining wall along Augusta Woods Drive will be maintained by proposed widening methods. The loading on the wall (both during construction and completion of the wall) will be evaluated and controlled to not impact the existing wall structurally. There are no other retaining walls anticipated at this time; any required in Final Design will be designed in accordance with VDOT standards.

### Major Drainage Structures

All drainage structures and modifications will be designed in accordance with VDOT standards to include evaluation of increased fill heights. The existing 48-inch concrete culvert below I-81 NB (STA 2121+00) will be extended to connect to the existing 5-foot x 5-foot box below I-81 SB (STA 3122+00). The existing triple 6-foot x 6-foot concrete box culvert below I-81 NB and I-81 SB (STA 2163+00 and STA 3161+00, respectively) will be connected with a standard triple 6-foot x 6-foot concrete box culvert.

Based on the As-Built roadway plans, the triple box culverts have the same structural section up to the skewed end section. A reduced capacity structural section was not utilized under the side slopes, as was occasionally done along the I-81 corridor when it was originally constructed. The existing 4-foot x 4-foot box culverts under I-81 NB (STA 2233+00) and I-81 SB (STA 3234+00) will be extended to accommodate the widening. In all cases, the proposed extensions will be designed and

Figure 4.3.1.2-2: I-81 SB/NB over Lewis Creek



detailed in accordance with standards to provide proper structure continuity and long service life.

### Summary of Structure Benefits

Our team has extensive experience designing, detailing, and constructing bridges that meet or exceed VDOT's commitment to safe, high-quality, long-term, low-maintenance structures. We understand the importance of incorporating constructability into designs and providing a Final Design that exceeds VDOT's expectations and requirements. **Through our team's successful design and construction history with the Department, we provide complete confidence in the I-81 Project's long-term asset performance and durability.**

# 4.4

## Project Approach

# SECTION 4.4 PROJECT APPROACH

## SECTION 4.4.1: ENVIRONMENTAL MANAGEMENT

Our team will develop a comprehensive Environmental Management Plan (EMP) that outlines the I-81 Project's environmental goals, confirms the satisfaction of permit requirements, meets VDOT's environmental commitments, and addresses schedule requirements for permitting and environmental compliance. The EMP will institute robust compliance, monitoring, reporting, and continuous improvement of our team's processes. The EMP will focus on avoiding and minimizing environmental impacts during design and construction by establishing proven procedures to address environmental issues, provide mitigation, and reduce risk.

Based on our team's review of the US Army Corps of Engineers (USACE) mitigation information Tracking System and coordination with commercial mitigation banks and the Nature Conservancy of Virginia, ample credits are available to provide compensatory mitigation for unavoidable impacts to Waters of the US (WOUS) in the geographic service area for compensatory mitigation. Under our plan, mitigation credits will include the purchase of stream and wetland mitigation credits from commercial banks and in-lieu credits from the Aquatic Resources Trust Fund for the I-81 Project. **As such, we anticipate no concerns with acquiring sufficient mitigation credits for the I-81 Project.**

### Environmental Management Approach during Design

Identifying recognized environmental conditions/areas of concern (AOCs) early in the design process will facilitate the timely issuance of environmental permits. Additionally, consistent communication within our team and resource agencies will help mitigate risk to the I-81 Project Schedule. Our approach during design will include the following elements. Upon receipt of a Notice to Proceed (NTP), our team will refine environmental resource locations in the I-81 Project corridor based on the Design Concept. Fieldwork and technical services will be performed as necessary and may include:

- Stream review and assessments.
- Threatened and endangered (T&E) species reviews and surveys.
- Environmentally sensitive areas (ESAs).
- Asbestos/lead inspections on structures.

*WRA's environmental staff have worked on several projects in the I-81 Project corridor and are familiar with its needs and issues. Their experience will enable the team to develop solutions that minimize impacts to ESAs in the area. This expertise will also assist in identifying and securing permits and environmental commitments required for a successful completion.*



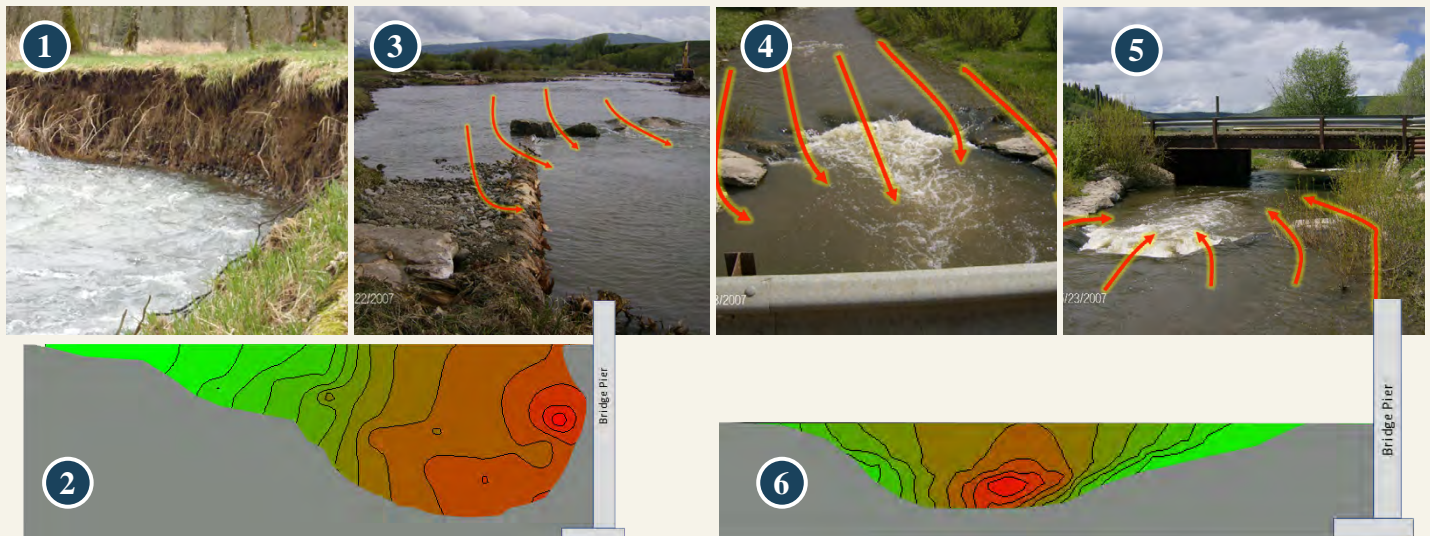
- Final noise analysis for permitting and environmental compliance monitoring.

If our refinement identifies unanticipated or unknown resources, our Design Concept will be modified to support avoidance and/or minimization opportunities. Our team will coordinate with the appropriate resource agencies to ensure resource protection of new resources identified. We will also review the environmental commitments included in the RFP, the Categorical Exclusion (CE), and other documentation and incorporate each into the Final Design.

The RFP Conceptual Design shows that a section of the Lewis Creek bank continues to erode in the vicinity of the I-81 bridges. The RFP Conceptual Design also requires riprap armoring of this bank to stabilize and protect the bank from continued accelerated bank erosion and protect transportation and utility assets. While we agree that asset protection is essential for the I-81 Project, we believe the approach may only partially solve multiple challenges.

Based on a review of the RFP Conceptual Design, attempting to protect assets without addressing overriding stream deficiencies only transfers issues downstream of the armoring. Doing so will result in erosion to downstream properties, which may undermine the armoring from the downstream limits that work back upstream over time and threaten the SB bridge piers and the sanitary sewer parallel to Lewis Creek.

## SPOTLIGHT: PROVIDING LONG-TERM SOLUTIONS FOR EROSION IN LEWIS CREEK



Degrading sections of streams often include high bank stress sections where improper plan and cross-sections result in high velocities resulting in high bank erosion allowing stream alignment to continue migrating across the channel valley. This type of degradation often threatens community assets, such as adjacent utilities and transportation infrastructure. In this case, the stream has moved significantly since the original construction where both an adjacent sewer pipe and I-81 bridge piers are being impacted by misaligned high velocities and accelerated bank erosion. Photo ① and isovel (i.e., velocity chart) ② demonstrate that heavy flows diverted into the Lewis Creek stream bank, and result in accelerated bank erosion. This is a long-term threat to both utilities and the I-81 bridges as stream migration across the corresponding valley continues.

Our Design Concept not only includes armoring an eroded Lewis Creek stream bank with riprap as identified in the RFP Conceptual Design but it also includes a plan to restore the section of Lewis Creek in the vicinity of the I-81 crossings. Our Design Concept provides a stable, long-term alignment beneath the bridges by utilizing cross-vanes and J-hook structures to remove higher flow velocities away from stream banks. It also provides a stable stream section to remove current threats to the adjacent sanitary sewer system as well as bridge piers. Photos ③ and ④ include images of cross-vanes and J-hooks that demonstrate how structures pull flow into the structure and away from stream bank surfaces. This is corroborated by the stream flow isovel produced at a stable stream restoration site.

As shown in Photo ⑤ and isovel ⑥, our Design Concept not only addresses armoring of exposed stream banks but provides a long-term flow and alignment management approach to limiting future stream migration and bank erosion to reduce threats to transportation and locality assets.

Our team will evaluate the effectiveness of armoring the compromised stream bank with riprap and re-establishing the stream alignment away from existing and proposed bridge piers and eroded stream banks. This will be performed through a natural channel stabilization concept that would center higher velocities in the middle of the stream along a preferred alignment offering long-term protection to both bridge assets and the adjacent sanitary sewer along the stream bank.

Employing a combination of cross-vanes and J-hooks, along with establishing a proper cross-section and plan/profile, will protect assets within the VDOT ROW while not transferring accelerated bank erosion to downstream properties.

### **CULTURAL RESOURCES**

Because our team's Design Concept remains within the RFP Conceptual Design's footprint, the previously concluded Section 106 effect determination that no historic properties are present or affected should remain valid. Our team will consider the four identified historic properties listed as eligible or potentially eligible to be design constraints and avoid impacting them beyond what is included in the RFP Conceptual Design. These properties include the C&O Railroad, J. Stacy Palmer Farm, an open-air terrestrial archaeological site beyond the northern limits of the I-81 Project, and the DeJamette State Sanatorium. We understand that any changes beyond the RFP Design may require additional cultural resources studies or coordination with the Virginia State Historic Preservation Office.

## ***PROTECTION OF T&E SPECIES***

Our team has reviewed the T&E species studies and coordination conducted by VDOT. The preliminary T&E Species Clearance Form (dated September 12, 2022) identified six state/federally listed T&E species, including the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), Madison Cave isopod (*Antrilana lira*), loggerhead shrike (*Lanius ludovicianus*), little brown bat (*Myotis lucifugus*), and tri-colored bat (*Perimyotis subflavus*). Based on database reviews as well as surveys our team is planning work schedules outside of potential habitat during likely time-of-year restrictions to avoid impacts with threatened and endangered species.

The T&E Species Clearance Form stated that the proposed I-81 Project might affect, but is not likely to adversely affect, the loggerhead shrike, Indiana bat, and northern long-eared bat and will have no adverse impacts on the little brown bat and the tri-colored bat. However, VDOT's August 2022 acoustic survey for T&E bats did not detect the presence of any T&E species, including Indiana bats, northern long-eared bats, or tri-colored bats.

The I-81 Project is not located within buffers of known hibernaculum for northern long-eared, Indiana, little brown, and tri-colored bats. Additionally, the May and June 2022 bat inventories found no evidence of T&E bats roosting on the bridges.

Our team is aware of the up-listing of the northern long-eared bat from a federally threatened to endangered species (effective January 30, 2023) and the up-listing of the tri-colored bat to a federally endangered species (anticipated in September of 2023). Based on the absence of bat species identified in the survey, no time-of-year restriction for tree cutting is currently required. However, with species up-listing occurring, our team is prepared to conduct bridge/structure inventories, surveys, and coordination as needed for clearance and permit acquisition.

To expedite the construction timeline, avoid delays, and reduce construction costs, **we are adjusting the I-81 Project's construction sequence to avoid cutting trees greater to or equal to 3-inches diameter at breast height (DBH) from April 1 through November 14, 2023, to avoid conflicts with listed bat species.** Additionally, upon NTP, our team will update T&E species reviews to confirm that the I-81 Project complies with special provisions and state and federal requirements.

Based on this, our team is confident that any regulatory changes in T&E listings could be avoided or mitigated through sequencing work so tree clearing could be conducted outside the required time-of-year restrictions. Upon receipt of an NTP, our team will continue coordination with natural resource and regulatory agencies to ensure compliance with species protections.

## ***SECURE WATER QUALITY PERMITS***

The RFP Conceptual Design and our Design Concept are estimated to impact approximately 0.38 acres (AC) of wetlands and 660 feet of streams. After receipt of an NTP, we will continue to look for additional ways to improve our Design Concept to avoid further impacts.

The I-81 Project will require authorization under a US Army Corps of Engineers (USACE) Nationwide Permit 23 (up to 1,000 LF and 0.5 acres of wetlands) with an approved Categorical Exclusion (CE). The I-81 Project includes two crossings over Lewis Creek and, as those locations have a drainage area greater than 5 square miles, will require a Virginia Marine Resources Commission (VMRC) VGP-1 Permit.

Our team will avoid and minimize impacts to streams and wetlands to the greatest extent practical. All construction impacts will be mitigated by purchasing wetlands and stream credits from approved mitigation banks or in-lieu programs.

## ***COMMUNICATION METHODS***

Consistent communication between the team and resource agencies will be crucial for maintaining the I-81 Project's schedule. The following communication methods will be utilized throughout design and construction.

- An **Environmental Constraints Map** will be developed upon receipt of an NTP. This map will depict the location of any environmental constraint and be distributed to all team members. It will allow our team to design and construct around areas of environmental concern.
- We will hold **regular coordination meetings** to discuss and understand environmental constraints and confirm that all disciplines address them. These meetings will also allow our team to discuss anticipated permit requirements and facilitate avoidance and minimization efforts. Our team will confirm that environmental constraints are recognized throughout the design process and that construction means and methods are understood in the permitting process. This communication will eliminate re-work during later design stages and avoid potential permit modifications.

- Through **regulatory agency pre-application coordination**, our team will coordinate impact limits with the appropriate regulatory agencies before submitting permit applications to ensure their completion and timely acquisition. This approach will expedite the permitting process by allowing each agency to review, comment, and provide recommendations on the impacts before the permit application is submitted.

## Environmental Approach during Construction

We understand the importance of working together to maintain compliance with environmental permits, complete construction monitoring efficiently, and keep up-to-date documentation throughout all construction phases. WRA's permitting staff have experience with all aspects of environmental compliance and currently have qualified staff assisting with environmental compliance for various VDOT construction projects in Virginia.

We understand the importance of maintaining compliance with all environmental permits, including erosion and sediment control (E&SC), Virginia Pollutant Discharge Elimination System (VPDES) stormwater, and wetlands permits. E&SC devices will be inspected and maintained daily by our dedicated erosion control crew to minimize the potential for sediment loss from the I-81 Project. These inspections will cover all aspects of the I-81 Project, including staging areas, waste areas, and haul routes.

### **ENVIRONMENTAL COMPLIANCE DURING CONSTRUCTION**

Environmental Compliance Manager (ECM) **Jessica Pech** will perform and document the required environmental inspections and corrective work. The ECM will also be responsible for maintaining the up-to-date record set of E&S drawings that are part of the Stormwater Pollution Prevention Plan (SWPPP). Our erosion control crew will utilize an "All-Hands-on-Deck" approach to inspect and maintain E&SC devices before and immediately following storm events. Additionally, we will establish a chain of responsibility for the team's and subcontractor's operations to confirm that the E&SC Plan and SWPPP are implemented and maintained over the Contract's life.

As part of the Preparatory Meeting, CM **Greg Suttle** and Environmental/Permits Lead **Taylor Sprenkle, PWD**, will lead environmental compliance meetings before beginning work in ESAs to ensure permit requirements are followed. VDOT and other appropriate



*WRA's environmental staff are experienced at providing environmental compliance training for construction staff. Members of our team have successfully trained construction staff and maintained permit compliance using this approach on several projects, including the Route 58 Lovers Leap D-B, I-64 Widening Exits 200 to 205, and the I-81 Atkins Bridge Replacement D-B Project.*

agencies will also be invited to review permit details and remind everyone of the permit's limitations.

As a critical part of permit compliance and before construction begins, our team will locate authorized impact areas and WOUS outside of impact areas to be avoided with orange safety fencing and signage to prevent accidental encroachment into these ESAs. Proper construction methodology and processes within ESAs are critical to I-81 Project's success. The team understands that working within ESAs has the highest likelihood of producing environmental violations.

Authorized work within the ESAs, including both temporary and permanent impacts, will be carefully planned to provide avoidance and minimization to the greatest extent practical. For example, tree clearing will be limited to the amount necessary to perform the Project work, temporary work within wetlands will be performed on mats, and non-erodible material will be used for temporary stream crossings and pump-around locations.

All temporary impacts to ESAs will be restored to pre-existing contours, stabilized, and seeded with the appropriate wetland mix before leaving the construction area. Where authorized permanent impacts intersect with non-impacted wetlands and streams, identification and strict adherence to the proper use of E&SC will occur. The following narrative outlines our approach to achieving environmental protection and compliance.



## **CONSTRUCTION ENVIRONMENTAL MANAGER**

We will take a proactive approach to environmental compliance to identify, correct and mitigate potential problems before they become violations. ECM **Jessica Pech** will report directly to the CM and have the authority to stop work. She has a documented work history, including water quality permits, Virginia and federal T&E species, hazardous materials, cultural resource compliance, air, noise, NEPA, and numerous other environmental disciplines to serve in this capacity for the I-81 Project.

Jessica will collaborate with and support the construction staff to meet environmental commitments. She will also advise the field construction staff of any issues or construction activities that may impact the Project's environmental permits. As our environmental design team identifies jurisdictional areas and prepares permit applications, non-jurisdictional areas will be evaluated for advanced work packages and incorporated into the baseline schedule.

## **PRE-CONSTRUCTION COORDINATION**

Before construction, the Environmental Constraints Map will enable our team to confirm and avoid areas of concern. WOUS areas will be demarcated to confirm that boundaries are easily identifiable by construction staff. Non-impacted streams and wetlands will be protected by silt and orange safety fences to avoid non-permitted areas. Environmental compliance training will also be conducted to educate staff on the I-81 Project's ESAs and methods to prevent and minimize impacts on ESAs. Our team will take a two-fold approach to mitigate environmental schedule risk that includes:

1. Providing expedited receipt of permits.
2. Verifying compliance during construction through an "all-hands-on-deck" compliance strategy that begins at NTP extending through Project completion.

Our team, which has worked together on several projects, has demonstrated the effectiveness of this approach by identifying environmental risks and outlining mitigation procedures in policies, plans, and staff education. The comprehensive EMP documents commitments and risks, permitting and compliance strategies, including education, monitoring, reporting, corrective actions, and compliance with state and federal requirements.

Branch will conduct a mandatory project-specific Health, Safety, and Environment (HSE) orientation for all construction workers, engineers, inspectors, subcontractors, VDOT, and regulatory agencies before starting work on the I-81 Project. The content of the safety orientation will

include training on the I-81 Project's health, safety, security plan, and environmental permit compliance.

Authorized individuals will have a sticker on their hard hats representing that they have attended HSE orientation. I-81 Project personnel who have not completed the HSE orientation will not be permitted to work on the I-81 Project and will be escorted off-site until the orientation is completed. This approach will assist in confirming that all personnel understand the safety expectation and that the I-81 Project-specific environment compliance and permit-specific conditions are noted. The Safety Manager and ECM will provide the HSE training.

## **E&SC INSTALLATION, MAINTENANCE, AND INSPECTION**

Following the issuance of the Construction General Permit (CGP), but before beginning land-disturbing activities, E&SC measures will be installed and inspected. The ECM will lead compliance and inspection of all E&SC measures before and throughout construction. As the RFP requires, the QAM (and his staff) will perform and document the official C-107 reviews twice weekly. Our team will promptly update VDOT regarding the status of any items identified during inspections, and we will quickly implement corrective actions. Furthermore, we will conduct internal reviews to ensure all documentation is updated and maintained.

Upon completion of the permitting process and Final Design, Branch will consider the addition of a third-party firm to perform independent E&SC inspections on the I-81 Project site.




## **APPROACH AND SOLUTIONS TO AREAS OF CONCERN**

**Figure 4.4.1-1** on the next page outlines potential environmental conditions/AOCs within the I-81 Project's footprint, as well as our team's proposed avoidance and mitigation strategies.

## **SCHEDULE INTEGRATION WITH ENVIRONMENTAL MILESTONES**

Obtaining environmental permit approvals promptly is always a schedule and planning priority. Our Proposal Schedule, provided behind "TAB 3" in Volume II, integrates key environmental permits, TOYRs, hold points, and approval activities. Initial permit acquisition activities will be geared toward obtaining permits and clearances so that geotechnical investigations can be completed soon after NTP so that final plans can be completed as early in the process as possible to avoid delays. A final permit application will be submitted to the agencies to authorize unavoidable construction-related impacts.

**Figure 4.4.1-1: Environmental Areas of Concern and Associated Avoidance/Mitigation Strategies**

ITEM	AVOIDANCE, MINIMIZATION, AND MITIGATION STRATEGIES	
<b>T&amp;E Species (General)</b>	<ul style="list-style-type: none"> <li>• Upon NTP, re-run threatened and endangered species database searches.</li> <li>• Engage resource agencies early in design/permitting process to determine potential impacts to T&amp;E species.</li> <li>• Avoid and minimize impacts to T&amp;E species to the greatest extent practicable.</li> </ul>	 <p>Loggerhead shrike</p>
<b>Nesting Migratory Birds under Bridges</b>	<ul style="list-style-type: none"> <li>• Proactively attach exclusion barriers before breeding season.</li> <li>• Follow VDOT’s nesting bird special provision.</li> </ul>	 <p>Little Brown Bat</p>
<b>Bats</b>	<ul style="list-style-type: none"> <li>• Time of year restrictions – work before they are an issue.</li> <li>• Develop the schedule to acknowledge the requirements.</li> <li>• Follow VDOT’s bat special provision SP522-000130-02 (no tree removal for trees greater than or equal to 3-inches DBH from April 1 to November 14).</li> </ul>	 <p>Northern Long-Eared Bat</p>
<b>Hazardous Materials</b>	<ul style="list-style-type: none"> <li>• Perform asbestos inspections on all structures not previously inspected and remediate per VDOT procedures.</li> <li>• Handle hazardous materials following all applicable federal, state, and local environmental regulations.</li> <li>• Prepare a SPCC plan before the start of construction and submit it to VDOT for review.</li> </ul>	
<b>Noise</b>	<ul style="list-style-type: none"> <li>• Not an anticipated impact.</li> <li>• Confirm final design noise analysis.</li> </ul>	
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>• Follow regulatory guidelines during construction and take all reasonable precautions to limit the emissions of VOC and NOx during construction.</li> <li>• Reduce dust in businesses and residential areas as well as for the safety of the traveling public.</li> </ul>	
<b>Cultural Resources</b>	<ul style="list-style-type: none"> <li>• Treat historic properties as design constraints: avoid impacting them beyond what RFP Conceptual Plans show</li> <li>• Avoid impacts to the viewshed of the four identified historic properties.</li> </ul>	
<b>Water Quality</b>	<ul style="list-style-type: none"> <li>• Our team’s proposed impacts would</li> <li>• Qualify for a USACE Nationwide Permit 23 (Approved Categorical Exclusions).</li> <li>• Adhere to the 12 401 Water Quality Certification Conditions so that a separate DEQ permit is not be required.</li> <li>• The I-81 Crossing of Lewis Creek will also require a VMRC VGP-1 permit since the respective drainage area is greater than 5 square miles.</li> </ul>	
<b>Others</b>	<ul style="list-style-type: none"> <li>• Carry out all NEPA commitments and support with appropriate documentation</li> <li>• Avoid scope/footprint changes that may require additional NEPA work and unanticipated schedule changes</li> <li>• Support VDOT’s final re-evaluations before ROW acquisition/construction (EQ-103, EQ-200, EQ-201)</li> </ul>	

## SECTION 4.4.2: UTILITIES

Many potential utility conflicts exist in the I-81 Project corridor. WRA’s utility mitigation strategy focuses on finding the best solution to accommodate each potential conflict, generally in this order: avoidance, minor adjustments, protection (in place), or relocation.

Throughout the development of our Technical Proposal, our team conducted an in-depth utility conflict analysis and initiated coordination with all relevant utility owners to fully understand the existing utility landscape and develop a plan to mitigate potential conflicts. These efforts allow our team to present a construction concept that will successfully coordinate, avoid, protect, or relocate utilities following all RFP and Contract requirements.

### Experience with Similar Utility Owners

WRA's Utility Coordination Team is experienced working on VDOT D-B projects, including those in the I-81 corridor. WRA's utility staff have performed utility

coordination with many utility companies in the past, including Appalachian Power, Dominion Energy, Citizen, Shentel, Verizon, Cox, Western Virginia Water Authority, City of Radford, Comcast, Cox, Segra, and Brightspeed.

### Utility Coordination, Adjustments, and Relocations

The key to successful utility coordination for the I-81 Project is early, frequent, and open communication with utility companies with potentially impacted facilities. As highlighted on the next page in **Figure 4.4.2-1**, we will use an active approach to utility coordination and relocation that follows the *VDOT Utility Manual of Instructions, Utility Relocation Policies & Procedures*, which is the standard method for addressing utility coordination and relocations in Virginia. Our team will emphasize hands-on coordination throughout the life of the I-81 Project. This is the most effective method for keeping utility companies focused and cooperating toward the shared goal of timely and cost-effective

relocations. Of equal importance are accurate and complete record-keeping and the timely posting of utility information in the VDOT RUMS system so that utility relocation tracking information is readily available to the team and VDOT partners.

## Utility Conflicts and Mitigation Strategies

Our team understands the importance of avoiding utility conflicts and relocations wherever possible. We have already taken steps to minimize conflicts in the Design Concept, located behind "TAB 1" in Volume II. The I-81 Project's limits are minimized to reduce the impacts on utilities from additional ROW and temporary construction easements. Bridge substructures and access to stormwater detention facilities are designed to avoid impacts on utilities.

### Utility Companies in the I-81 Project Area:

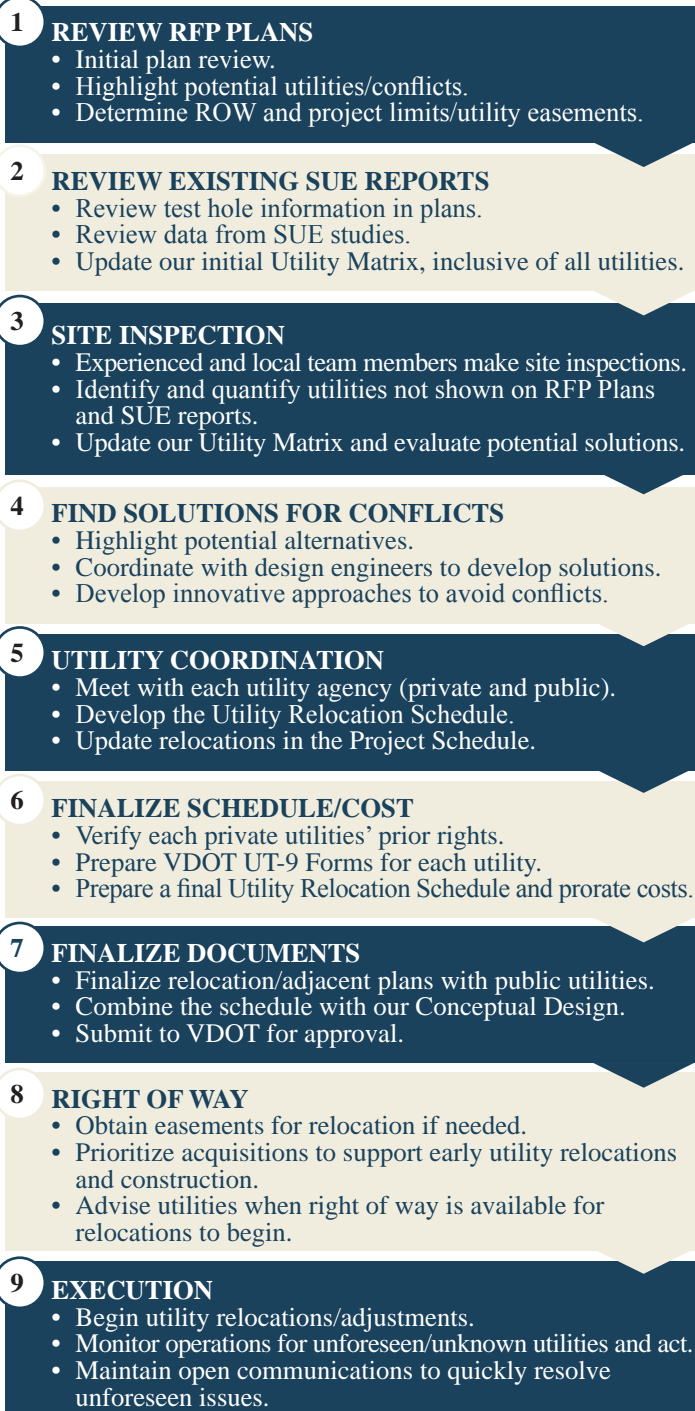
- Shentel
- Comcast
- Segra
- Dominion
- Shenandoah Valley Electric Cooperative
- Columbia Gas of Virginia
- Augusta County Service Authority
- Buckingham Branch Railroad
- City of Staunton
- Verizon
- VDOT

As the Design Concept progresses, we will minimize relocations with design modifications or protection of the asset; we will relocate utilities to accommodate proposed improvements as a last resort. All relocations will be addressed in detail in the CPM Schedule, emphasizing avoiding schedule delays and defining with logic where work can be shifted, when necessary, to avoid delays to daily construction efforts. The Utility Impact Matrix, provided in *Section 4.3.1(g)*, identifies a portion of utilities that conflict with the proposed work. We've also included a matrix containing all utilities in the I-81 Project area behind "TAB 2" in Volume II.

Utility coordination activities began during the proposal preparation stage of the I-81 Project. All utility companies with facilities in the I-81 Project area have been contacted, the correct contact people with those companies have been confirmed, and their existing facility records have been obtained. These records have been compared to the RFP Design survey and our site reviews for accuracy and completeness.

We have reviewed Shentel's construction plan for their in-progress fiber relocation south of Augusta Woods Road and their proposed route North of Augusta Woods Road to MM 225. Depths on all crossings for Shentel's proposed facility are unknown at this point but, based

**Figure 4.4.2-1: Utility Coordination and Relocation Process**



on discussions with Shentel, can be expected in Shentel's plans to reflect a depth that will not impact any I-81 Project improvements.

When the design has reached a completeness level to show all utility impacts, our team will hold a Utility Field Inspection (UFI) Meeting. Plans and a preliminary VDOT UT-9 Form will be distributed to all affected utility companies approximately two weeks before this meeting. During the UFI Meeting, all utilities will be able to put forth relocation strategies, preliminary

schedules for performing adjustments and relocations, and utility easement requirements, if they exist (although no easements are anticipated at this time).

Mitigation strategies to ensure the timely relocation of the facilities in conflict will start with consistent communication with the utility contacts to remind them of their schedule commitments and ensure that they have their preliminary steps underway to complete the work. The utility designation survey and test holes will be a top priority for the I-81 Project as soon as an NTP is issued. These activities will determine the exact locations of the existing buried lines and make plans for any necessary relocations.

Our team will use the VA811 Location Enhanced Ticket Search (LETS) service offered by VA811 to confirm daily that all Miss Utility Tickets are cleared before proceeding with any excavation work. WRA will provide all field supervisors with training in the use of the app. Supervisors will also ensure that all field marking work reported has been performed by the utilities. If a discrepancy is noted, the three-hour locate request feature of the Underground Utility Damage Prevention Act will be utilized to get the facilities marked.

**If a new utility facility is discovered, or if the work of the design-builder damages an existing facility, work in that area will immediately be halted.** We will work diligently to identify the facility owner in question and provide all assistance needed to make certain that services are quickly restored. If an unknown facility requires relocation, work will begin as soon as possible to design a new path to eliminate any conflicts.

Advanced utility coordination activities will occur immediately following the issuance of the NTP. Activities will include hosting the 45-day Utility Meeting and Preliminary Utility Review Meeting with all relevant utility companies to explain the I-81 Project's impact and work sequence. We will distribute proposal plans to the utility agencies to allow their review as early as possible. Utility companies will be made immediately aware of facilities most likely in conflict and how those conflicts will play into the I-81 Project's staging. Our team will compile the locations of all necessary utility test holes and investigations performed to verify if the locations for the lines shown in the survey match the actual locations on site. Close coordination with the utility owners will continue as the final design progresses.

Our team will make sure that designs minimize or avoid utility conflicts by using an online, cloud-based utility coordination tracking system that incorporates

“ball-in-court” notifications and sets due dates for utility coordination tasks. Utility representatives will be able to access the current version of the tracking system at all times. We do not anticipate that utility easements will be necessary for the I-81 Project. Due dates will be set for utility relocation and adjustments, plan and estimate submittals, and "no conflict" letter submissions. Further, we will harness our extensive resources to benefit each utility company.

As utility adjustments and relocations are completed, we will update VDOT regarding the utilities' progress and close them out as appropriate. The utilities will be directed to submit prompt and correct drawings for all necessary As-Built land use permits.

### **Integration of Utilities into the Construction Sequence to Prevent Delays**

Upon award of the I-81 Project and receipt of an NTP, utility coordination efforts will occur in concert with the developed construction sequence to minimize impacts on the critical path. A significant utility impact is fiber optic lines throughout the median of I-81. Relocation of these facilities to a permanent location along the shoulders of the future roadway will be a paramount goal in the early stages of the I-81 Project.

Our team will accelerate mitigation efforts for utility conflicts with proposed bridge substructures to avoid schedule impacts for the bridge construction schedules. We will provide consistent feedback from the utility relocation efforts to our scheduling team to confirm that the schedule remains optimized for completion.

### **SECTION 4.4.3: GEOTECHNICAL**

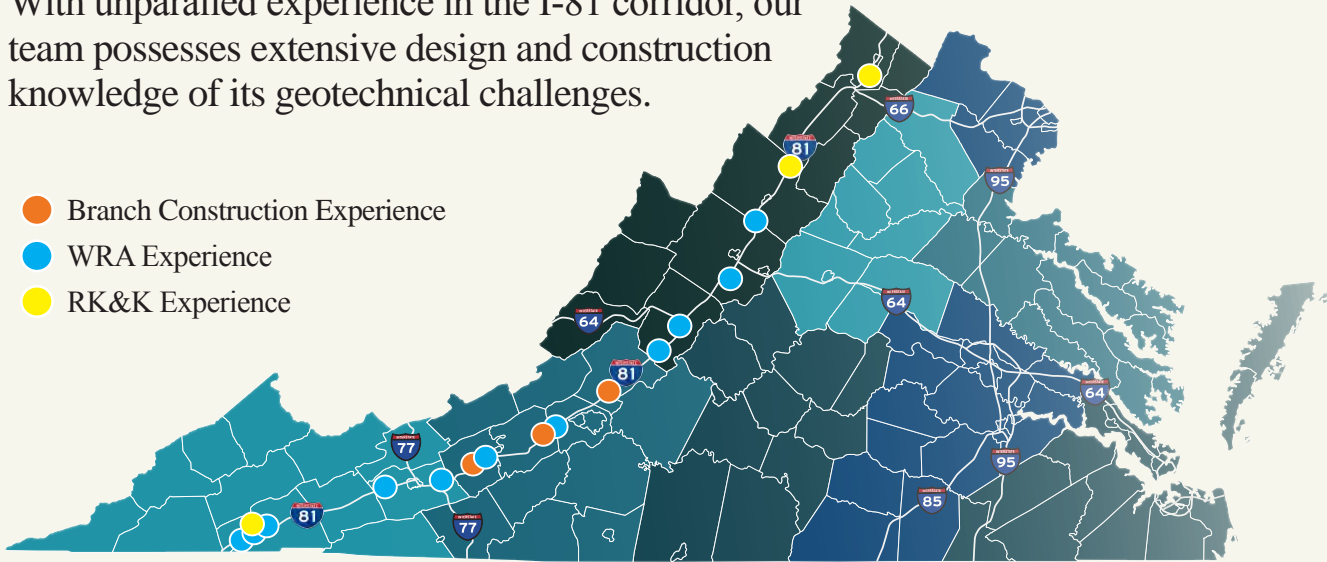
Our team has reviewed the available geotechnical information for the I-81 Project in the RFP documents, emphasizing the Geotechnical Data Report (GDR). We will perform further investigations upon receipt of the NTP and approval of the Subsurface Investigation Plan by VDOT. These efforts will validate and confirm our proposed Design Concept.

A leading provider of geotechnical, dam, and tunnel engineering services, WRA, RK&K, and Branch have extensive experience in the I-81 corridor, including numerous VDOT bridge and roadway projects. Our geotechnical engineers are leaders in karst terrain evaluations, with over 75 projects completed in Virginia and the Appalachian Ridge and Valley; evidence of this is highlighted on the next page in **Figure 4.4.3-1**. Geotechnical Task Lead **Jeff Basford, PE** will lead a group of geotechnical engineers who have mitigated karst

## Experts in Analyzing Virginia's Karst Topography

With unparalleled experience in the I-81 corridor, our team possesses extensive design and construction knowledge of its geotechnical challenges.

- Branch Construction Experience
- WRA Experience
- RK&K Experience



terrain and incorporated shale fills on similar projects, including sinkhole remediation and characterizing shale durability and its impacts on transportation and commercial/industrial facilities. Our planned testing labs are accredited by the AASHTO Materials Reference Laboratory. Our extensive geotechnical engineering experience with the various local geologies and similar projects will guide our design and analysis.

### Construction Methods

Our team's geotechnical engineers will be an integral part of the I-81 Project's construction phase and will work together with Branch, the design team, and the Quality Assurance/Quality Control (QA/QC) Team. WRA will be on-site during critical geotechnical construction activities, including shoring and foundation construction, and on standby to help identify and mitigate potential issues that arise during construction.

Having the Geotechnical Engineer-of-Record (EOR) intimately involved in construction will reduce risk, reduce overall costs, streamline the schedule by reducing response time to Requests for Information (RFIs), and provide a better overall product to VDOT and the traveling public. The Geotechnical EOR will provide certification that the work was subjected to the necessary testing and inspection requirements and meets the specifications.

### Addressing Geotechnical Challenges

The I-81 Project is located within the Ordovician Edinburg Formation and the Ordovician Martinsburg

Formation. Site conditions include highly variable subsurface conditions that can create unexpected issues, increased costs, and schedule delays during construction. WRA's local experience and expertise will enable our team to identify associated risks by developing a suitable subsurface exploration and performing laboratory testing to classify the subsurface materials. We identified geotechnical risks on the I-81 Project utilizing the borings and test results provided with the RFP.

Our team understands the site's geotechnical characteristics and has used and refined methods to mitigate similar risks. Our mitigation approaches and previous applications in VDOT's Staunton District and other similar areas have proven highly successful. Our subsurface exploration and testing program will include soil test borings and possibly hydro-track probing, rock coring, and in-situ geophysical laboratory testing. This program's results will be the basis of our Final GERs, including recommendations to mitigate the potential geotechnical risks identified. The Final GERs could also disclose additional potential risks. WRA will identify these risks and provide mitigation alternatives in the final reports.

Our team is experienced in leading the process of dealing with problematic shale on construction sites throughout Virginia, including the Route 15 DB/PPTA and I-64 Exits 200-205 D-B projects. When encountering shale that is determined to be non-durable, our team will perform

a thorough slake durability testing and construct test embankments to determine a roller pattern and appropriate equipment to break down the shale into a dense matrix instead of an open rock fill. It is our experience that equipment such as a CAT 815 compactor with deep sheep's feet wheels effectively breaks these shale materials down.

## Construction near Existing Foundations

New construction of mainline bridges will be performed close to existing foundations. Limited workspace along the existing I-81 corridor could negatively impact the traveling public and worker safety, MOT, scheduling, and stability of existing structures. Also, settlement of the underlying soils due to adjacent embankment construction could result in settlement of the existing embankments and foundations supporting the existing bridges. Our team has extensive experience with these situations and our design will reflect necessary mitigation measures to minimize the impacts discussed in this section.

Most existing bridges are founded on vertical and battered piles and shallow spread footers on rock. New bridge designs will include an assessment to determine if these existing foundations will see additional loads or lose capacity. The I-81 Project will require the addition of foundation elements while maintaining the integrity of the existing foundations.

### **MITIGATION STRATEGIES**

- Our experience with temporary shoring methods applicable to the Staunton District and bridge replacement techniques that are safe and effective will benefit the I-81 Project's construction.
- We will develop efficient temporary and permanent shoring designs to mitigate potential impact to the existing bridge foundations and roadway elements.
  - » Most of the bridge abutments are supported on pile foundations so excavations for the proposed abutments will only be subject to traffic loading. Support of Excavation (SOE) will consist of soldier piles, sheet piles, or soil nails. If heights greater than 12 feet are required tiebacks will be incorporated.
  - » Many of the pier foundations are founded on shallow rock. We will target founding the new piers at the same elevation to avoid impact on the existing structure. When founding these foundation elements on limestone we are experienced in preparing the uneven rock surface as directed by the Geotechnical Engineer prior to casting concrete.
- Our Design Concept carefully considers the integrity of the existing foundations to be utilized in the final



bridge configuration. Items we considered include the development of appropriate foundation types and their locations, construction sequence, shoring, and using lightweight materials to construct embankments.

- Our team will collaborate to provide the needed supportive excavation systems on the I-81 Project site.

## Slopes

Our Design Concept includes critical and non-critical cut and fill slopes throughout the I-81 Project limits. Existing slopes are generally at 2:1 and appear stable currently. The Design Concept utilizes 2:1 or flatter slopes. Also, some slopes containing fine-grained soils may have stability issues requiring further flattening of the slope or other stabilization techniques to achieve an adequate factor of safety.

RFP borings indicate most of the slopes on the I-81 Project are comprised of decomposed rock sampled as sand and gravels or granular fills.

### **MITIGATION STRATEGIES**

- Our Design Concept will minimize the disturbance of existing slopes.
- We will perform the necessary classification and shear strength testing to evaluate the slope stability.
- RFP borings indicate existing soils in proposed cut or fill slopes consist of fine-grained soils. Therefore, extensive exploration and advanced laboratory testing will be performed to properly characterize this material's shear strengths, including peak shear strengths for deeper material and fully softened shear strengths for infinite slope stability analysis.

## Limestone and Karst Formations

The southern portion of the I-81 Project is within a formation that commonly contains karst features. Karst features include highly erratic rock surfaces, sinkholes, caves, and other karst features that adversely affect foundations for bridges and walls, stormwater management structures, embankments, and pavements, among others. Improper design and construction could lead to sinkholes, excessive settlement, or other karst-related problems that require future and ongoing repairs to pavements and structures, affecting the flow of traffic and cost.

### MITIGATION STRATEGIES

- WRA is experienced with design and construction in karst environments and understands critical steps to reduce risk, including:
  - » Identifying karst features.
  - » Controlling surface water.
  - » Not interfering with the groundwater.
  - » Designing the most appropriate foundation system based on geologic conditions.
- Developing a sinkhole mitigation plan that can be implemented quickly, if/when needed.
- Based on experience, geology maps, the RFP borings, and the As-Built bridge plans for the Route 250 Interchange, karst features were not found to be present but are still potentially present. Our team will further define these potential karst features' limits during the subsurface exploration program by drilling and geophysical surveys.
- Our bridge foundation design accounts for the erratic nature of karst geology. Abutments provide flexibility for the lateral locations of piles during construction (i.e., if a pile skews, walks, or is damaged during driving, it can be re-driven at a different location without having to re-design the entire abutment).
- Pre-boring piles, which will reduce the effects of shallow obstructions and provide proper pile alignment.

### Unsuitable Soils

The technical requirements indicate that unsuitable materials within 3 feet of pavement subgrade are to be removed or remediated. The RFP stipulates a minimum CBR of 3. However, the RFP pavement design requires the subgrade soils to be classified as A-2-6 or better or have a minimum Mr of 12,000 psi determined by VTM-140 testing. Based on our experience in the I-81 Project corridor, low strength unsuitable high-plasticity clays and silts existing as subgrade level, classification and unconfined compression testing (VTM-1) indicate most of the subgrade soils to be granular in nature or



*WRA's geotechnical engineers are very knowledgeable with karst conditions, including those for the karst rock foundation preparation on VDOT's I-81 over Halls Bottom D-B in Bristol, VA.*

have relatively high Mr value. Some locations indicate unsuitable soils exist at the pavement subgrade.

The effects of unsuitable soils include increased costs and delays in construction for undercutting and/or treatment of unsuitable materials. An inadequate pavement section could lead to poor service life and increased maintenance and long-term costs.

### MITIGATION STRATEGIES

- Performing additional Unconfined Compression Testing (VTM-140) and AASHTO soil classification testing determine the sites Mr to validate the minimum pavement sections in the RFP. WRA will perform this work during the scope validation period.
  - » Utilize the prescribed methods for subgrade remediation in the Technical Requirements.
  - » For areas where unsuitable soils are encountered and subgrade is more than 12 inches above grade we will remove the unsuitable material to a depth of 3 feet below pavement subgrade and place suitable fill material
  - » For localized areas where unsuitable material is encountered at pavement subgrade will utilize a 2 foot under-cut geotextile and select material.
  - » Long stretches of unsuitable materials at pavement subgrade elevation and that is identified during the design phase will be remediated by chemical stabilization. Because we only anticipated unsuitable to be fine grained in nature, lime is the anticipated reagent, which will be mixed at a predetermined rate based on laboratory testing.

Wet soils that are considered unsuitable due to high moisture contents (except those containing deleterious materials) will be improved by drying and/or chemically

treating with lime or cement so that they can be reused as compacted embankment fill. Imported Full Depth Reclamation (FDR) will be mobilized on the I-81 Project to construct the subbase pavement layer. Therefore, it will be readily available for use in chemically stabilizing or drying high moisture content soils.

## Pavement Design

Our team will provide the **Flexible Pavement Alternative for the Mainline Widening and Shoulder**. Upon evaluating the base material options, we have determined that incorporating the virgin BM-25.0D base asphalt will provide the most consistent and cost-effective product. Construction phase testing will determine the necessary amount per square yard of cement and Number 10 screenings to mix with the subgrade soils to achieve the necessary strength.

Branch will leverage its suppliers to identify sources for aggregate and cementitious materials for optimizing the FDR job mix formula. Pre-production testing will be performed to verify that the mix will have the strength specified in the Special Provisions for FDR.

### Selected Flexible Pavement Alternative – Mainline and Shoulders:

- **Surface:** Asphalt Concrete, Type SMA-12.5 (64H-22) at 220 lbs/SY
- **Intermediate:** Asphalt Concrete, Type SMA-19.0 (64H-22) at 330 lbs/SY
- **Base:** 7.5 inches Asphalt Concrete, Type BM-25.0D
- **Subbase:** 12 inches Full-Depth Reclamation

## SECTION 4.4.4: QA/QC

Quality is measured by meeting or exceeding VDOT's requirements, specifications, and expectations. By implementing a formal QA/QC Plan, our team will effectively navigate the processes, reviews, and reporting activities required to meet quality guidelines and deliver the I-81 Project to VDOT, the citizens of Augusta County, and the City of Staunton on time and budget.

Our QA/QC Plan will detail the expectations of our team, roles and responsibilities of each team member, interactions of team members, methods to determine enough staffing for the work, testing and inspection requirements, and specific requirements for communication and documentation. The QA/QC Plan will meet the *VDOT's Minimum Requirements for Quality Assurance and Quality Control on Design-Build and Public-Private Transportation Act Projects, July 2018*. We will reinforce to all team members that quality starts with the individual.

Quality Assurance Manager (QAM) **Ben Lineberry, Jr. PE** will act as a single point of contact with VDOT and manage the QA/QC Plan per the Contract. With over 32 years of experience, Ben will work independently of the designer, contractor, and QC team. He will act on behalf of VDOT to ensure that all work, materials, testing, and sampling are performed according to the Contract's requirements and the Approved for Construction (AFC) plans and specifications. **Ben will be available immediately upon Contract award and on the I-81 Project site full-time for the duration of construction operations.**

Ben will be supported by Lead Roadway QA Inspector **Matthew Coffin, CCM** and Lead Structures Inspector **Keith Maynard**. Matthew and Keith will be on the site full-time for the duration of all construction of the I-81 Project and verify that all activities performed by Branch are in accordance with the Contract requirements and observed by the QA firm (Volkert). **Additional QA inspectors will also be on-site as work levels demand, with additional support available utilizing materials testing technicians or additional QA inspectors.**

## Design QA/QC Approach

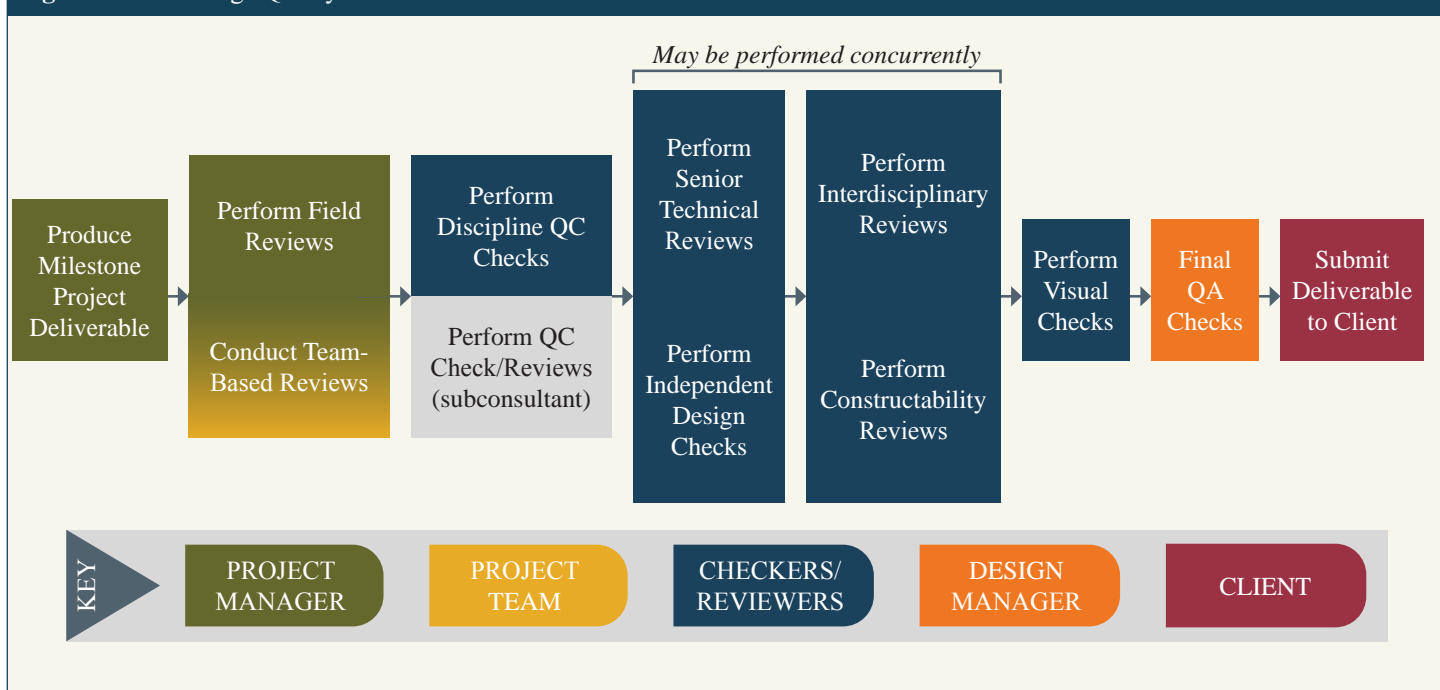
Design QA/QC Managers **Brad Stipes, PE** and **Owen Peery, PE** will be integrated design team members. They will be invited to all management meetings to facilitate consistency and communication. Brad and Owen will work closely with DM **Mike Russell, PE, DBIA** and design discipline task leaders to confirm that the review process proceeds according to the QA/QC Plan.

Our experience and commitment to providing quality and knowledge of RFP requirements and standard specifications have significantly reduced VDOT's review time and minimized the need for additional QA/QC reviews. The design quality process, demonstrated on the next page in **Figure 4.4.1-1**, will be managed using conformance checks, independent technical reviews, and internal audits. These checks will verify that our drawings and specifications comply with applicable criteria and contract requirements. In previous projects, this attention to detail on QA/QC reviews and processes has proven beneficial to VDOT in performance audits.

Quality checks and reviews will be delivered per the quality planning process and identified in a Project Deliverable Quality Matrix, which will establish the framework for all design QA/QC activities. The Project Deliverable Quality Matrix will define the time frames for all quality checks and reviews necessary before submitting a deliverable to VDOT. Our team will complete a discipline QC check,



**Figure 4.4.4-1: Design Quality Checks and Reviews**



independent design check (when applicable), and senior technical review (when appropriate). Those comments will be resolved and verified before entering the interdisciplinary or constructability review process.

Entrusted Engineer-in-Charge **Yisehak Shata, PE** will be the conduit between the construction and design teams during this interdisciplinary review. All checks and reviews will be completed, and those comments will be resolved and verified before completing the QA review. We will confirm that each design element receives a thorough review and is documented accurately.

QC will begin with assigning the most appropriate person to a design task. Each team member will be responsible for controlling the quality of the deliverable. The specific checking process is demonstrated graphically on the next page in **Figure 4.4.4-2** and will involve the following:

- **Originators:** These will be engineers or other qualified persons that initiate a work product. They will continuously check specific work elements during production and must address all comments, questions, and revisions noted by the checkers. The Originator will also coordinate reviews with the Design QA Managers, who maintain the schedule to ensure the timely completion of required checks.
- **Checker:** These reviewers will perform detailed checks of the design or reviews of reports; they are not involved in producing those documents. These

team members will have technical knowledge and qualifications, at a minimum of the level of the originators of the work being checked or reviewed.

- **Back-Checker:** These individuals will review the Checker's comments and resolve any differences regarding the comments. The Back-Checker will then make, supervise, and implement the agreed-upon changes. This person will typically be the originator of the document.
- **Corrector:** This will be the person who updates the original document after the Back-Checker has agreed with all of the checker's comments. This person can also be the Originator.
- **Verifier:** This individual will review the corrected document to verify that the agreed-upon changes have been incorporated correctly. This person may be the Checker or the Originator if that person did not update the design document.

Our team anticipates that the Department will continue utilizing the Deliverables Management component of ProjectWise to process and track the required design submittals. Once a submittal is finalized through the previously described QA/QC process, it will be transmitted to Branch's assigned document manager. This individual will be responsible for processing the submittal into Deliverables Management following the appropriate review flow developed for the I-81 Project.

This coordination will confirm that all relevant staff is notified that the submittal is ready for VDOT’s review.

## Construction QA/QC Approach

**QAM Ben Lineberry, Jr., PE** will report to the DBPM and oversee QA for all construction activities. Ben will report findings directly to VDOT and have the authority to stop any work that fails to meet contract requirements. He will oversee the personnel responsible for performing QA inspections and testing all materials used and work performed. Throughout design and construction, Ben will make certain that adequate QA staff is available to ensure that VDOT does not require additional QA/QC oversight. He will determine staffing levels based on the Project Schedule and develop a Testing and Inspection Plan for each Work Package. **We anticipate that the number of QA inspectors will range from two to eight at any given time.**

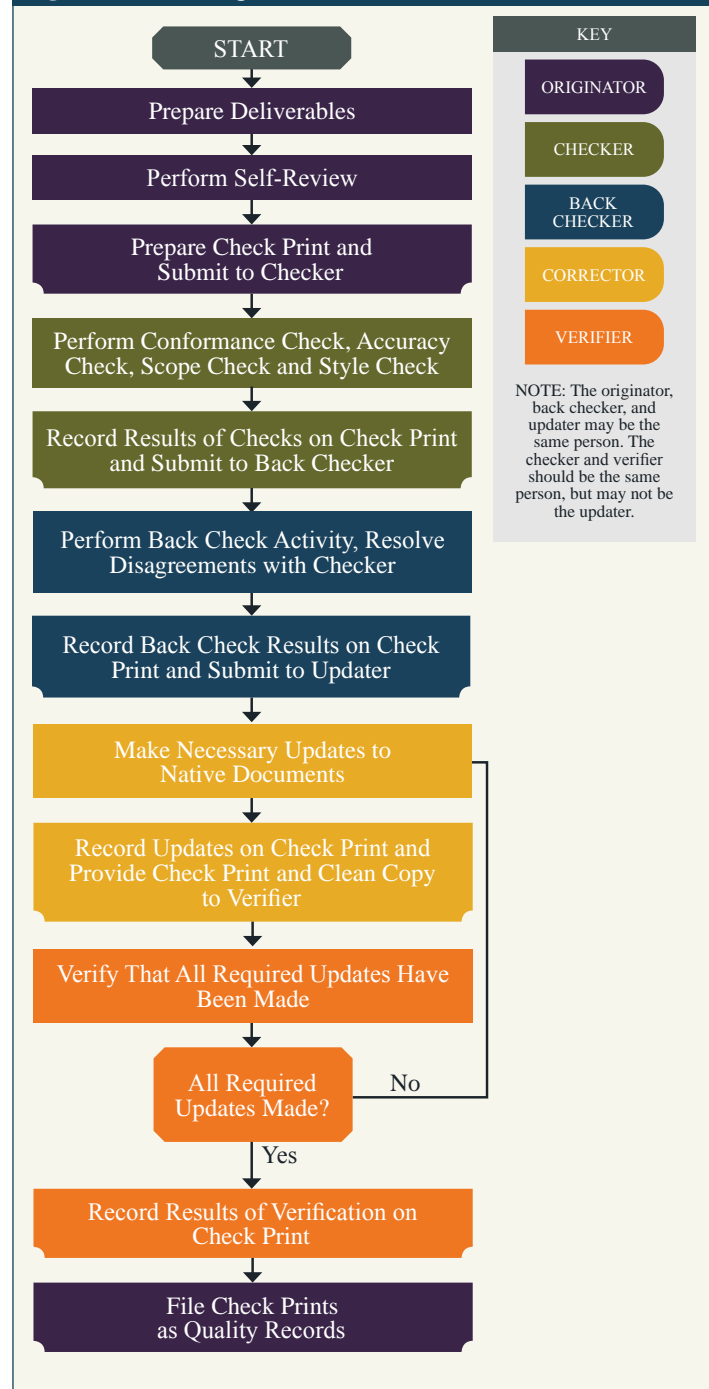
Our QC staff, operating independently from the QA staff, will perform all required sampling and testing as required by the contract documents. QA and QC will have separate independent AASHTO Materials Reference Library (AMRL) certified testing laboratories. The QAM will determine and certify to VDOT whether the materials and work comply with the approved drawings, specifications, and applicable standards and reference documents, as indicated in the Contract. The QAM will also confirm that all inspectors have the appropriate certifications for the testing to be performed.

**The QC Manager (QCM) will be determined upon a receipt of an NTP, report directly to the CM, and manage the day-to-day QC inspections and material testing.** The QC Team will be responsible for the inspection of construction activities and all QC sampling, testing, and required analysis of materials to make sure the construction quality is verified at frequencies that meet or exceed contract requirements.

Roadway and structure QC inspectors will complete an Inspector Daily Report (IDR). The IDR will be submitted to the QCM, QAM, DBPM, CM, and others daily, along with documentation of any material tests performed. Specific staffing levels will be determined by the schedule and Inspection and Testing Plan developed for each work package. **We anticipate that the number of QC inspectors will range from two to eight at any given time.**

The construction component of our QA/QC Plan will address the specific requirements and elements of the construction QA/QC following the *2018 VDOT Minimum Requirements for Quality Assurance and Quality*

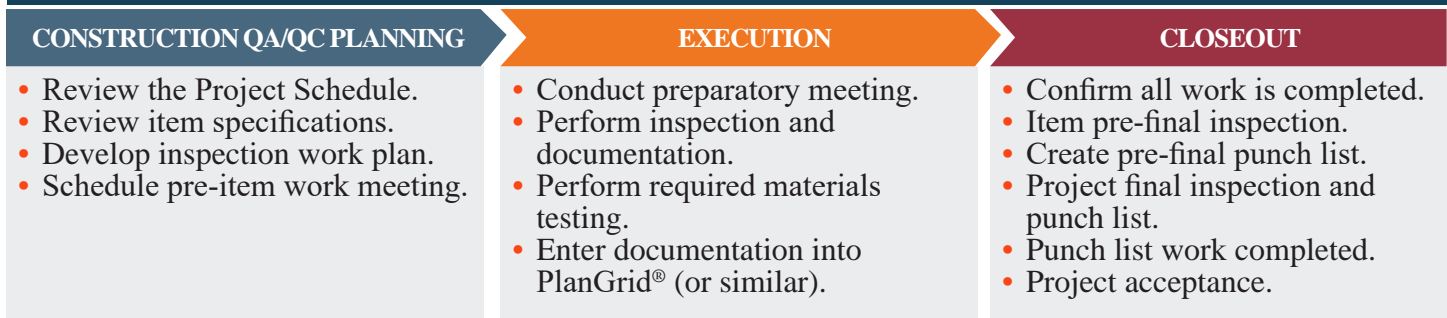
**Figure 4.4.4-2: Design Check and Review Process**



*Control on Design Build and PPTA Projects.* Before each AFC Work Package is submitted for review and acceptance, the QAM will review it with the DM to determine the specific elements of work and the associated QA/QC requirements that are included in the package.

As part of the AFC Work Package, the QAM will work with the DM to identify all work elements that require testing. As part of this process, the QAM and the QCM will review the Project Schedule to determine the staffing needed for the work package. The QAM and QCM will also confirm that all required certifications

Figure 4.4.4-3: Construction Quality Assurance/Quality Control Process



are maintained, identify the definable features of work included in the package, and establish the minimum testing and inspection requirements needed to certify that all work is completed based on the quantities in the work package comply with the I-81 Project's requirements. The construction quality process, demonstrated above in **Figure 4.4.4-3**, will provide appropriate staffing for the job and establishes all team members' expectations for the QA/QC of the work.

The next step to confirming that all requirements are met will be conducting a pre-item work meeting before the preparatory meeting for each definable feature of work. This meeting will establish who will be required at each preparatory meeting, ensures all information is reviewed, and verify that all previous work is completed so that a successful preparatory meeting can occur. Once the construction phase begins, and as established by the specific AFC Work Package QA/QC Plan, QA personnel will monitor the work and the QC process for adherence to the plan.

Hold point meetings will be held for all major construction operations. QA personnel will also coordinate their independent assurance system to independently evaluate all sampling, equipment, testing, and inspection procedures used by QC personnel. This system will confirm that work has been tested and inspected and that those procedures used during testing and inspection meet industry standards and comply with the requirements of the I-81 Project.

Adjustments will be to improve workflow, testing processes, and documentation processes to ensure that the QA/QC produces verifiable and documented testing of work and works seamlessly with contractor operations. The QAM will compile, maintain, and update the Project Materials Book and complete the VDOT C-25 forms. The QAM will maintain the Project Materials Book electronically on VDOT Form TL-142DB and will perform monthly reviews of the Book by spot-checking at least five materials for their source documentation.

The QA/QC Plan will specify the documentation required for the I-81 Project. It will establish a system of cloud-based document control, allowing all team members immediate access to the information needed. The system will also comply with VDOT's D-B Construction Quality Improvement Program (DBCQIP) by putting procedures to document that tasks were completed per the requirements and DBCQIP checklist.

### Construction QA/QC Staffing Plan

Our team understands that QA/QC staff must be experienced and robust to ensure we deliver a final product that meets or exceeds the requirements. Our team will incorporate proven processes and procedures to standardize and streamline the construction quality approach. The techniques developed will establish proper controls so that the I-81 Project will meet all quality requirements and contractual expectations of VDOT and will be built to meet or exceed service-life requirements. **The DBPM will be responsible for ensuring that policies are effectively implemented.** He will also confirm that our team is staffed with knowledgeable and dedicated people committed to designing and constructing the I-81 Project.

**Figure 4.4.4-4** on the next page summarizes the roles and responsibilities of our key team members, as well as anticipated staffing levels for QA and QC roles.

**Figure 4.4.4-4: Anticipated Staffing Levels and Responsibilities**

ROLE/NAME	RESPONSIBILITIES
<b>DBPM</b> Jim Kreider, PE	Jim will serve as the DBPM and provides overall Contract administration. He is our Team’s point of contact with VDOT, is responsible for the integration of all I-81 Project disciplines, compliance with the schedule, dispute resolution, coordination of public outreach and meetings, and establishment of the QA/QC program.
<b>DDBPM</b> Justin Campbell, CCM	Justin will report to, be directly supervised, and trained by the DBPM and perform similar duties under his direction.
<b>Entrusted EIC</b> Yisehak Shata, PE	Yisehak will report to the DBPM and verify that all engineering work is integrated, conforms with the Contract Documents, and delivers a safe, constructible, and functional Project. Yisehak will be assigned to the I-81 Project full-time and actively engaged in coordinating all engineering decisions from Notice to Proceed through Final Acceptance.
<b>DM</b> Mike Russell, PE, DBIA	Mike will be responsible for the design process, including work by design subconsultants. He is responsible for establishing and overseeing the Design QA/QC program for all disciplines involved in design including review of design, working drawings, shop drawings, specifications, and constructability.
<b>Deputy DM</b> Andrew Koser, PE	Andrew will report to, be directly supervised, and trained by the Design Manager and perform similar duties under his direction.
<b>QAM</b> Ben Lineberry, Jr., PE	Ben will report to the DBPM and can report directly to VDOT. He will be responsible for the development of and adherence to the QA/QC Plan, ensuring all construction activities, materials, inspections, testing, and sampling are performed per the Contract and approved construction plans and specifications. He will have full written authority, provided by the DBPM, to stop any activity not complying with the Contract, and can recommend to VDOT that payment be withheld until the activity is brought into compliance. During the design phase, Ben will be on the I-81 Project site full-time for the duration of construction operations.
<b>Lead Roadway QA Inspector</b> Matthew Coffin, CCM	Matthew will be the Lead Roadway Inspector and report to the QAM. In this role, he will manage the QA process, focusing on roadway elements and supported by additional QA Inspectors as needed, to confirm that all construction activities are performed per contract requirements and observed by the QA team. Matthew will be onsite full-time for the duration of construction activities.
<b>Lead Structures QA Inspector</b> Keith Maynard	Keith will be the Lead Structures Inspector and report to the QAM. In this role, he will manage the QA process, with a focus on structure elements and supported by additional QA Inspectors as needed, to confirm that all construction activities are performed in accordance with contract requirements and observed by the QA team. Keith will be on site full time for the duration of construction activities.
<b>QA Inspectors, Testing Technicians, and Laboratory</b>	Volkert will provide QA inspectors to ensure QA testing and inspections of all construction activities are performed, QC inspections are observed, and correction of non-conformities are completed per the Contract documents. Inspectors will report directly to the QAM. ECS Mid-Atlantic, LLC will provide QA testing technicians and performs QA laboratory testing. ECS will provide an AMRL-certified laboratory and be independent of QC laboratory testing.  <i>Staffing Levels: 2 to 8 Personnel at Any Given Time</i>
<b>Construction Manager</b> Greg Suttle	Greg will be responsible for the construction and the QC program and confirm that the materials used, and work performed, follow the Contract documents and approved plans. Greg will be onsite full-time for the duration of construction activities.
<b>QCM</b>	The QCM will be responsible for construction QC and oversee construction QC testing and inspection operations. The QCM will assign inspectors and testing technicians for each work package and monitor the reporting documentation to confirm that work packages are completed in conformance with the Contract requirements.
<b>QC Inspectors, Testing Technicians, and Laboratory</b>	QC inspectors, testing technicians, and laboratories will be responsible for QC testing and construction inspection for conformance with the QA/QC Plan and completing the required documentation. They will possess current VDOT materials certifications for the types of testing and/or inspections they are assigned to complete. The QC laboratory will be AMRL-certified, independent from the QA laboratory, and be utilized for all QC laboratory testing services.  <i>Staffing Levels: 2 to 8 Personnel at Any Given Time</i>

# 4.5

## Construction of the Project

# SECTION 4.5 CONSTRUCTION OF THE PROJECT

## SECTION 4.5.1: SEQUENCE OF CONSTRUCTION

Construction of the I-81 Project will be a well-coordinated effort to use adequate means and methods to complete all work while ensuring safe and effective traffic flow. Our approach will deliver success through state-of-the-art construction equipment, highly qualified local staff, technical expertise, and I-81 corridor knowledge. The foundation of this success will be adherence to a tailored Project Management Plan (PMP). **Our ability to self-perform approximately 60% of the work will provide the schedule control necessary for timely delivery.** Moreover, no construction activity will proceed without assurance that all safety and environmental protection measures have been followed.

### Project Work Areas

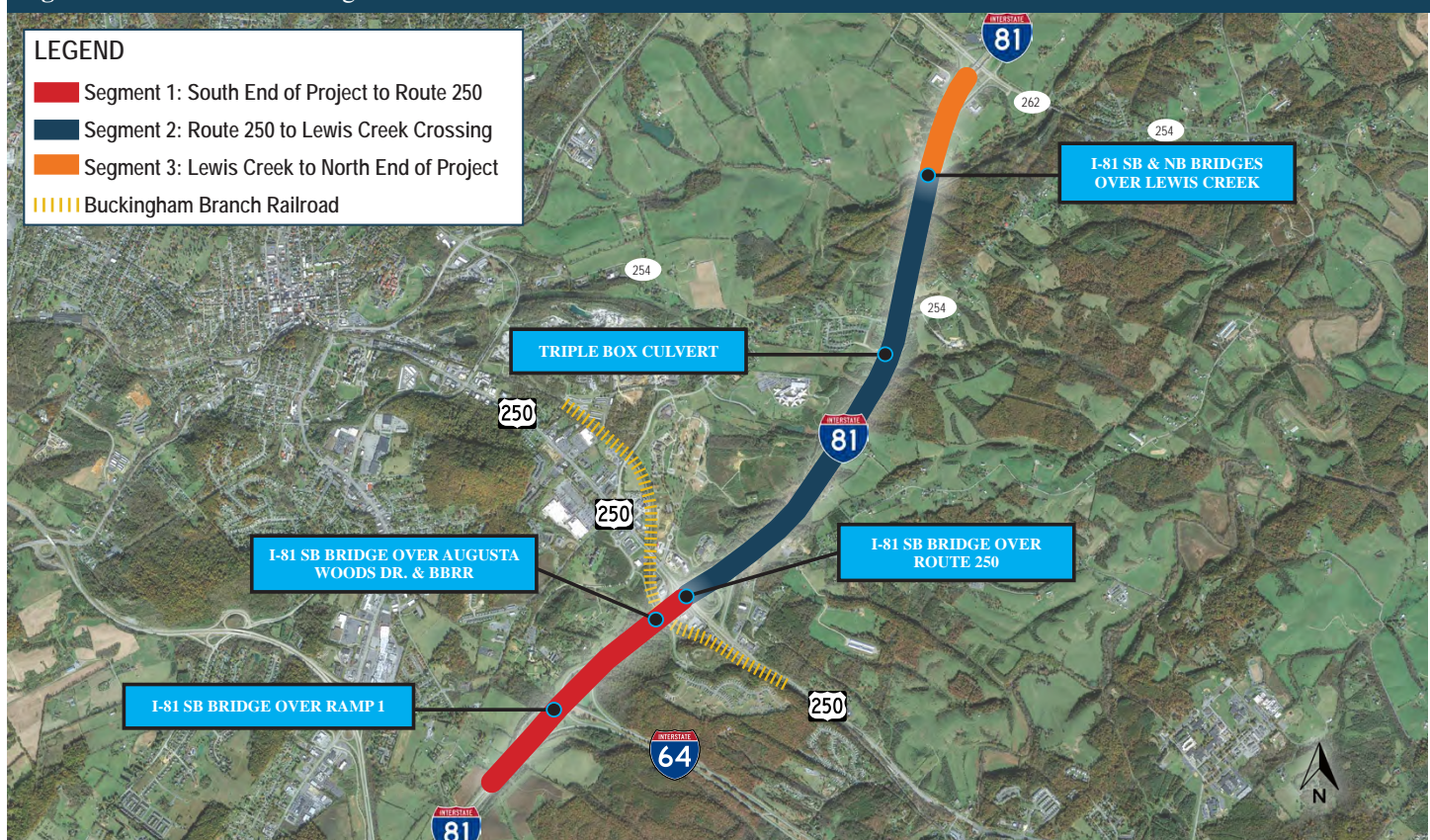
Our overall construction plan was developed through an intimate knowledge of the local area. All key team members reside near the I-81 corridor, and many use the corridor daily. As shown in **Figure 4.5.1-1**, construction operations are organized logically and systematically

into three segments based on the earthwork balance and reducing the surplus material hauls off-site.

Our approach simplifies construction and enhances schedule flexibility to ensure on-time, on-budget delivery of the I-81 Project. Our Design Concept has refined MOT processes with fewer construction phases and minimal traffic switches, resulting in fewer accidents and improving driver expectancy. A high-level explanation of critical elements of work for proposed construction activities follows in this section.

*Our Project Segmentation Plan balances earthwork to keep approximately 13,600 TRUCK TRIPS off of the local roadways. This will reduce the impacts of hauling and make the local roadways safer during construction activities. Work will be performed within each segment concurrently to achieve a Final Completion Date of June 8, 2027.*

Figure 4.5.1-1: Construction Segmentation Plan



## SEQUENCE OF CONSTRUCTION

### Phase 1 Construction Operations

This Phase will include preparatory operations on I-81 NB and SB lanes. The following activities will take place during this phase:

- Centralized staging areas will be established and mobilization will take place.
  - Shoulder strengthening will be performed throughout the entire I-81 Project corridor (both NB and SB as required) to facilitate traffic shift and Phase 2 construction. Construction will remove the existing rumble strip. Activities will be performed at night under temporary lane closures and by progressing through all segments, efficiently allowing for linear progression and repetition of activities.
  - Pavement improvements will be constructed at I-81's gore with Ramp 1, Route 250, Ramp A, Route 250, Ramp C, Route 262 Ramp A, and Route 262 Ramp C.
  - SWM basins will be constructed working behind the existing guardrail at wider shoulder areas or from alternate access points. This will ensure that all necessary E&SC measures are in place before any land-disturbing activities in later Phases.
  - Existing utilities located in the median will be removed and relocated.
  - Early Work Packages will be performed in areas where there are no utility conflicts or environmental issues. Activities will include performing maintenance work (i.e. repairs on existing substructure elements) on the following bridges:
    - » Segment 1, Bridge B638 I-81 SB over Ramp 1)
    - » Segment 1, Bridge B639 (I-81 SB over BBRR)
    - » Segment 1, Bridge B640 I-81 SB over Route 250)
    - » Segment 3, Bridges B641 and B642 (I-81 over Lewis Creek)
  - Temporary MOT for the switch to Phase 2 will be established (e.g., temporary barrier service, construction signs, and temporary pavement markings, among others) within the mainline corridor. Traffic will be shifted onto the strengthened shoulder for both NB and SB. Operations will be performed in a stacked, linear progression through all areas to attain greater efficiency, with crews and subcontractors performing repetitive tasks.
- Temporary concrete median barrier will be installed.
  - Construction access to the median will be established throughout the entire I-81 Project and set up satellite staging locations for on-site distributions.
  - The I-81 Project work area will be cleared and grubbed, which will include the demolition or removal of any conflicting existing roadway elements.
  - Remaining utility coordination and relocations not completed in Phase 1 will be performed.
  - Median grading and drainage construction will be performed throughout all three segments to the final proposed roadway and bridge alignments.
  - Partial demolition will be performed, temporary shoring constructed, and bridge structures widened to the median in phased construction at the following:
    - » Segment 1, Bridge B638 (I-81 SB over Ramp 1):
      - Existing abutments will be extended on HP pile-supported or spread foundations accordingly.
      - New piers will be built in-line with the existing on spread foundations to accept widened superstructure.
      - New steel girders will be installed.
      - Replace existing bearings below the closure.
      - The existing deck will be replaced and joints eliminated with deck continuity pours and deck slab extensions.
      - Ultrasonic impact treatment (UIT) will be performed on the existing cover plate ends and the existing structural steel re-coated.
    - » Segment 1, Bridge B639 (I-81 SB over BBRR):
      - Existing abutments will be extended on HP-pile supported foundations.
      - New piers will be built in-line with the existing on spread foundations to accept widened superstructure.
      - A crash wall/barrier will be constructed.
      - New steel girders will be installed. Existing bearings will be replaced below the closure.
      - The existing deck will be replaced and joints eliminated with deck continuity pours and deck slab extensions.
      - Perform UIT treatment on existing cover plate ends and re-coat the existing structural steel.
    - » Segment 1, Bridge B640 (I-81 SB over Route 250):
      - Existing abutments will be extended on HP pile-supported foundations.
      - New piers will be built in-line with existing on HP pile-supported or spread foundations accordingly to accept the widened superstructure.

### Phase 2 Construction Operations

Phase 2 will include grading and drainage, construction to widen the bridges, construction of miscellaneous structures, and roadway widening in the median. It will also include the following:

- New steel girders will be installed.
- Existing bearings replaced below the closure.
- The existing deck will be replaced and eliminate joints eliminated with deck continuity pours and deck slab extensions.
- UIT treatment will be performed on existing cover plate ends and existing structural steel will be re-coated.
- » Project Area 3, Bridges B641 and B642 (I-81 over Lewis Creek):
  - Temporary stream diversion will be performed.
  - Existing abutments will be extended on HP pile-supported foundations.
  - New piers will be built in-line with existing on spread foundations to accept the widened superstructure.
  - Final stream stabilization will be performed.
  - New PCB type prestressed concrete beams will be installed.
  - Existing bearings will be replaced and concrete beam end repairs performed.
  - The existing deck will be replaced and joints eliminated with deck continuity pours and deck slab extensions.
- Stone base and pavement structure will be placed up to the intermediate asphalt layer throughout, thereby only leaving surface asphalt and permanent pavement markings to be completed in Phase 4.
- Temporary MOT for the switch to Phase 3 (e.g., temporary barrier service, construction signs, temporary pavement markings, among others) will be established and the traffic switched from the right shoulder to the median throughout the work zone.

### Phase 3 Construction Operations

Phase 3 will include grading and drainage, construction to complete bridges, and roadway widening. The following will also take place:

- The work area will be cleared and grubbed, which will include demolition or removal of any conflicting existing roadway elements.
- Any needed ramp reconstruction work will be performed. Pavement patching and cross slope correction will be performed, as required by the RFP.
- Right shoulder side grading/drainage will be performed throughout to the final proposed section and structures.
- Guardrail and permanent sign structures will be installed along the right shoulder.
- Widening and rehabilitation of the following structures will be performed:

- » Segment 1, Bridge B638 (I-81 SB over Ramp 1):
  - Existing bearings below closure will be replaced to complete all bearing replacements.
  - Existing deck will be replaced and joints eliminated with deck continuity pours and deck slab extensions.
- » Segment 1, Bridge B639 (I-81 SB over BBRR):
  - The crash wall will be completed (if not completed in previous phase).
  - Existing bearings will be replaced below closure to complete all bearing replacements.
  - The existing deck will be replaced and joints eliminated with deck continuity pours and deck slab extensions.
- » Segment 1, Bridge B640 (I-81 SB over Route 250):
  - Existing bearings will be replaced below closure to complete all bearing replacements.
  - The existing deck will be replaced and joints eliminated with deck continuity pours and deck slab extensions.
- » Segment 3, Bridges B641 and B642 (I-81 over Lewis Creek):
  - Existing bearings will be replaced below closure to complete all bearing replacements.
- » The existing deck will be replaced and joints eliminated with deck continuity pours and deck slab extensions.
- » Installation and integration of ITS will occur.
- » Complete roadside development will take place throughout the I-81 Project work zone.
- » Staged removal of temporary MOT items will be performed in conjunction with Phase 4 activities, including final surface paving and permanent pavement marking installation.

### Phase 4 Construction Operations

During Phase 4, final paving, pavement markings, installation of signage, and construction of remaining Bridge Pier Protection System (BPPS) will occur. The following will take also place:

- Final paving and installation of pavement markings in all segments will be performed.
- BPPS will be constructed along Ramp 1 and Route 250 at the completed bridge construction.
- Permanent signage will be installed in all segments.
- Any temporary sediment basins designated to remain as a SWM structure will be converted to their permanent configuration.
- Traffic will be switched into its final pattern.



## CONSTRUCTION ACCESSES

Our construction access points will be in compliance with the RFP.

## Safety and Operations

Safety will always be our team’s top priority each day. The DBPM and Safety Manager will manage a stringent Safety Program that will empower employees at all levels to stop work anytime an unsafe action occurs. Our Safety Plan will be based on proven and successful plans from recent VDOT projects. The Safety Team, led by Safety Manager **Danny Minnix, CSP**, and supported by Construction Manager **Greg Suttle**, superintendents, the construction safety team, and all site personnel, will share a common goal: *to maintain a safe site*.

Safety measures our team will implement for the I-81 Project are highlighted in this section and are summarized below in **Figure 4.5.1-2**. We are aware that construction activities on I-81 present extraordinary challenges for safety. With direct knowledge of interstate corridor projects, Branch and WRA completed the I-64 Widening Exits 200-205 D-B Project in New Kent and Henrico County, VA. Through that project, which is very similar in nature to the I-81 Project, our team brings valuable lessons learned to enable the successful completion.

Site constraints created by working between opposing lanes of traffic will require effective planning for and utilization of equipment resources, optimum access point placement, and a dedicated safety mindset. Mobilizing large equipment into a work zone bounded on two sides by interstate traffic is no small task. The addition of the constraints presented by high traffic volumes and transportation logistics will dictate plans that minimize equipment relocation. We will mitigate these risks by effectively sequencing work and utilizing innovative approaches that eliminate exposure.

We will strategically place construction entrances, allowing safe departure and entry into travel lanes. Lag vehicles for large incoming loads are also critical elements in this planning. It is standard for safe bridge access to have access points on the run-off end of a bridge crossing. Doing so will ensure that delivery trucks are backing up to the site, which decreases the crane pick radius and precludes hoisting materials over the cab when offloading, thus improving overall safety. Our team will perform median widening and bridge construction operations behind barrier.

When working in constrained circumstances, large material deliveries, such as structural steel, will not

**Figure 4.5.1-2: Project Safety Measures and Mitigation Strategies**

ITEM	SAFETY MEASURES & MITIGATION STRATEGIES
<b>Pre-Project Safety Planning</b>	<ul style="list-style-type: none"> <li>• During design, the Safety Manager will incorporate the safety components from the QA/QC checklist when reviewing plans and will consider safety concerns when facilitating constructability reviews and identify potential safety hazards.</li> <li>• A list of action items will be generated to confirm that potentially hazardous work activities are safely and rigorously eliminated.</li> </ul>
<b>Safety Training</b>	<ul style="list-style-type: none"> <li>• All employees will undergo safety training specific to the I-81 Project. Training will include first aid/CPR, trenching and excavation, fall protection, and rigging.</li> </ul>
<b>Site Orientation Meetings</b>	<ul style="list-style-type: none"> <li>• Safety orientations will be provided to all individuals who visit the I-81 Project site.</li> <li>• Orientations will confirm that all on-site personnel has a clear understanding of safety requirements.</li> </ul>
<b>Pre-Task Planning</b>	<ul style="list-style-type: none"> <li>• The Construction Manager will perform pre-task planning daily and before the start of each new task. Activities will include completing a Job Hazard Analysis form.</li> <li>• Activities will confirm that work is accomplished safely, stringent procedures are implemented, and appropriate safety devices and tools are provided.</li> </ul>
<b>Daily Safety Meetings</b>	<ul style="list-style-type: none"> <li>• The Construction Manager will hold daily meetings with all on-site personnel to review the Daily Risk Assessment.</li> <li>• Meetings will address the day’s activities (established in Pre-Task Planning Meetings) to address safety concerns.</li> </ul>
<b>Site Walks</b>	<ul style="list-style-type: none"> <li>• Performance of daily site walks by superintendents and foremen to ensure safety compliance.</li> <li>• Once a month, the Construction Manager will attend a more formal site walk with the construction team. Equipped with a detailed Job Inspection Checklist, the Construction Manager will review on-site safety compliance and evaluate the site for potential safety risks.</li> </ul>
<b>Project Specific Safety Program</b>	<ul style="list-style-type: none"> <li>• Addresses the unique attributes of this I-81 Project, including its environment, traffic conditions, size, and scope to keep the traveling public and stakeholders informed of construction activities and progress.</li> <li>• Mandatory safety orientations will be performed for all workers and site visitors, regardless of affiliation.</li> <li>• Will comply with Virginia Occupational Safety and Health Standards and will include safety policies, procedures, training programs, worksite controls, and incident response procedures for the safety and health of workers and the general public.</li> </ul>

be staged on-site and will be sequenced for nighttime delivery and then set directly from the offload. Qualified riggers, certified operators, and experienced staff ensure critical operations are completed flawlessly under challenging circumstances. This calm confidence comes from a strong safety culture and greater assurances for the safety of workers and the traveling public.

### Measuring Safety Performance

Frequent job site inspections are essential to actively measuring safety performance. The Job Inspection Checklist, work plans, Job Hazard Analysis (JHA), and Daily Risk Assessments (DRAs) are proactive ways to track and address safety on-site, incorporate corrective actions, and identify additional tools needed to perform the work safely. By focusing on “doing the right thing,” Branch’s Safety Leadership Team has taken safety reporting to a new level. Through consistent experience and observation, employees know that reporting any safety issue is the right thing to do.

Safety Manager **Danny Minnx, CSP** will maintain a Safety Statistics Report that tracks safety incidents, including recordable, reportable, and near-miss incidents. Danny will also track the number of staff hours worked safely to help identify operations that require improvement. He will lead monthly team meetings to evaluate the type, severity, and frequency of safety issues on the I-81 Project and to identify trends as they emerge. This combination of site walks and active safety documentation will enable constant coordination and the opportunity to learn from safety trends.

Our team will track safety metrics so incidents can be one-offs, not the norm. Also, we will review all reported incidents, including near misses, with field staff to reduce the potential for future incidents.

### Staging and Storage Areas during Construction

As demonstrated below in **Figure 4.5.1-3**, potential staging and storage areas will be located within the construction limits of the I-81 Project. Materials will be carefully coordinated with the crews’ needs to limit double handling and minimize large storage areas’ needs. Our team will provide each supplier with specific delivery instructions and directions to mitigate potential impacts on the traveling public and stakeholders.

Construction entrances adjacent to the public road will provide delivery access to the work areas. Our team will perform activities in a manner that ensures that pre-existing conditions are not worsened. We will coordinate

all construction entrances to make certain that appropriate sight distance is available for safe egress from these access points. Workspace limitations will necessitate prioritizing limited on-site storage and the utilization of separate primary staging locations.

Most material deliveries will be routed first to primary staging locations and then, as needed, distributed to the respective work locations. Doing so will preclude drivers unfamiliar with access points and safety protocol from presenting a hazard and keep the work areas clear of unnecessary obstructions.



## SECTION 4.5.2: TRANSPORTATION MANAGEMENT PLAN

We will deliver the I-81 Project in a way that exceeds expectations regarding minimizing public impacts during construction. All aspects of our Transportation Management Plan (TMP) and Temporary Traffic Control (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.

To accomplish these safety, mobility, and communication goals, highlights of our approach include:

- Analyzing existing safety concerns and mitigating them before major construction activities.
- Monitoring of work zone conditions throughout construction by our Lead Traffic Engineer.
- Analyzing and adjusting temporary lane closure hours to further reduce public impacts.
- Utilizing enhanced safety devices and strategies that exceed minimum requirements.

### Traffic Management Task Force

Our team is committed to reducing the I-81 Project's anticipated impacts on the traveling public and adjacent facilities while exceeding the safety requirements of the RFP. Immediately following NTP, our team will establish a multi-discipline **Traffic Management Task Force (TMTF)** focused on planning and developing the TMP and designing and implementing the I-81 Project's work zone traffic control program. The TMTF will consist of contractors, engineers, and our safety team. Additionally, VDOT and third-party stakeholders will be invited to participate. This task force will facilitate construction collaboration that ultimately confirms that safety, mobility, and constructability are optimized.

To provide coordination with the adjacent projects, the TMTF will act as a liaison between their design and construction teams, VDOT, and applicable third parties from the initial onset of TMP development. Coordination will provide seamless transitions between projects and MOT operations so that the safety, mobility, construction sequencing, and design features are fully integrated.

Our TMP will place a particularly heavy emphasis on eliminating the need for temporary lane closures to the largest extent possible, as we thoroughly understand the impact that lane closures can have on the traveling public, residents, and local businesses. To meet our high safety and mobility standards, the TMP and TTC plan

development will be led by our Lead Traffic Engineer, **Jeff Kuttesch, PE, PTOE**. Jeff will work with a team of traffic engineering design experts who will build mobility and safety into every element of the TMP.

Our team commits to additional field reviews by our traffic engineering staff during construction. These regular reviews will verify that traffic controls have been implemented correctly and recommend further enhancements. This enhancement will be an addition to the Work Zone Safety Inspections completed by our TMTF and QA and QC Team.

### Managing Traffic during Construction *CLOSURES, DETOURS, AND TIME OF DAY RESTRICTIONS*

Our proposed approach satisfies all RFP requirements and construction phases was developed to avoid the need for detours. Temporary lane and shoulder closures will comply with the requirements in Part 2, Section 2.10.3 of the RFP. We will utilize 15-minute maximum full stoppages for overhead work, such as erecting overhead sign structures.

### *FLAGGING OPERATIONS*

If required, flagging will be conducted by certified staff following the *VWAPM*. Portable temporary rumble strips will be utilized following VDOT's requirements. Minimal use of flagging is anticipated as part of this Project, and flagging operations will be constrained to the existing roads, Augusta Woods Drive and Route 250. Flagging will be conducted by certified staff in accordance with the *VWAPM*.



*Our multidisciplinary Traffic Management Task Force (TMTF) will focus on planning and developing a focused Transportation Management Plan for the I-81 Project. Comprised of members of the design and construction teams, VDOT, and key stakeholders, the TMTF will confirm that safety, mobility, and constructability are optimal throughout design and construction.*

## LANE WIDTHS AND WORK ZONE SPEED REDUCTIONS

Our proposed approach for lane widths and speed reductions during construction satisfies or exceeds RFP requirements. We will provide the required 32-foot minimum clear pavement width, including the required 11-foot lanes and left and right shoulder widths. The MOT and temporary traffic control elements will be designed to 70 mph. Our team will seek a reduction in the posted speed limit during construction of 60 mph, as required by Part 2, Section 2.10.1.

### I-81 SB BETWEEN THE ROUTE 250 AND I-64 INTERCHANGES

With approximately 30,000 VPD in each direction, the I-81 Project corridor is considered as a major north-south route through Virginia and is heavily used for commerce and truck traffic. **Our team is committed to VDOT's goals for limiting the duration of construction on I-81 between the Route 250 and I-64 interchanges.** One of our primary reasons to limit the duration of work in this area is that work on the SB I-81 bridge over BBRR and Augusta Woods Drive will temporarily reduce the weaving distance between the Route 250 interchange on ramp and the exit to I-64.

As discussed in *Section 4.3*, maintaining traffic while reconstructing the bridge requires a MOT phase where the Route 250 Ramp A gore will shift south of the bridge. Our sequence of construction is designed to maintain the existing weaving distance during Phase 2 (median widening). Prior to Phase 3, all gore improvements at Ramp 1 will be completed with temporary lane closures. When the traffic shift to Phase 3A occurs, additional signage, and 'shields' painted on the travel lanes, will help drivers confirm their lane choice.

The Phase 3A MOT lane configurations are optimized to maximize the weave distance, while making sure that oncoming vehicles from Route 250 Ramp A can merge at highway speed. Finally, the bridge construction has been created to reduce the duration of Phase 3A and move quickly to Phase 3B, which is designed to match the existing weaving distance. **Our approach will reduce construction impacts, and improve traffic operations over this critical section of SB I-81 between the I-64 and Route 250 interchanges.**

### SEQUENCE OF CONSTRUCTION – PHASING

As discussed in *Section 4.5.1*, we have divided the corridor into three construction segments. This sequence of construction activities was developed to ensure that traffic is maintained through the I-81 Project work zone.



Phasing elements will include the following:

- Phase 1 work activities will be completed with temporary lane and/or shoulder closures in accordance with the allowable RFP restrictions. The existing number of lanes and configuration/location will be maintained outside of the allowable closures.
- Phase 2 work activities occur will within the median area. Travel lanes will be shifted 4 feet outside onto the strengthened shoulder pavement to create room for the installation of temporary traffic control barrier to protect the median work. Work zone access points will be in compliance with the RFP requirements.
- Phase 3 work activities will generally occur along the outside of the roadway. Travel lanes will be shifted to the median. Long-term construction activities will be completed behind temporary traffic control barrier to protect the public and workers. To improve safety, temporary barrier will not be installed in areas where the work activity does not require it, such as guardrail installation. Work zone access points will be in compliance with the RFP requirements.
- Phase 4 work activities will be completed with temporary lane and/or shoulder closures in accordance with the allowable RFP restrictions.

### Lane Widths Exceeding the RFP

Except for work near the bridges, our sequence of construction provides 12 foot travel lanes in Phase 3. They are located on the permanent alignment and are accompanied by the full width median shoulder. Additionally, temporary concrete barrier is not required in these areas so motorists also have a paved, full-width

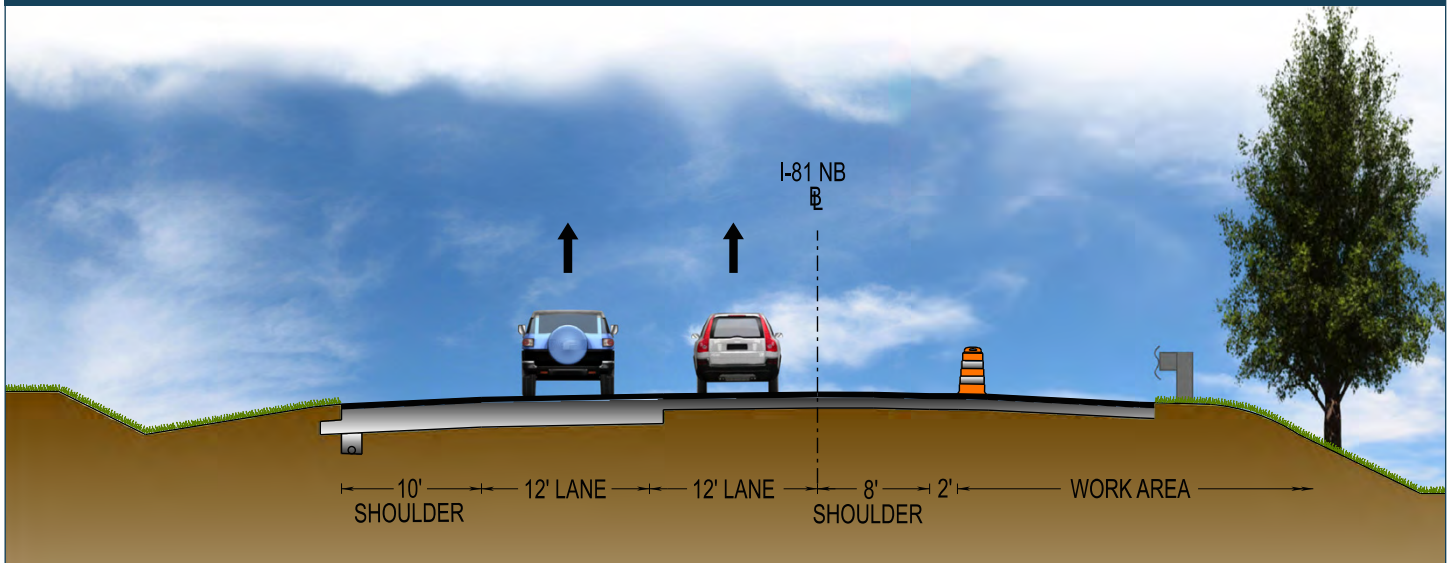


#### Design Enhancement:

#### Lane Widths

*Our Design Concept aids in limiting disruptions to traffic and improves traffic operations and incident management during construction.*

**Figure 4.5.2-1: Sequence of Construction**



outside shoulder. **Figure 4.5.2-1** above demonstrates our Design Concept's typical sequence of construction.

### Incident Management

**David C. Scott** is our **Incident Management Coordinator (IMC)** and will direct the team's response to incidents. David, a former law enforcement officer for the City of Roanoke, will leverage his knowledge of the I-81 corridor and relationships with local law enforcement and first responders to coordinate our **Incident Management Plan (IMP)** on-site implementation. Elements of our IMP are highlighted in **Figure 4.5.2-2**.

David will be VDOT's point of contact for incident management and will apply National Incident Management System (NIMS) principles and practices throughout construction. His incident-related certifications include FEMA ICS/NIMS 100/200 & 700; FEMA SHRP2 "TIM" Responder Training; FEMA/VDEM Hazardous Materials Awareness; American Red Cross First Aid/CPR/AED Instructor; and EPRO Aerial Life, Scissor Lift Instructor. He will confirm that proper procedures and communication protocols are in place and facilitate communication with local first responders regarding any roadway conditions due to construction activities.

David will be available to respond to incidents during construction operations within the I-81 Project work zone. He will coordinate with stakeholders throughout construction operations to make certain that each is aware of changes in the traffic pattern, review the IMP and anticipated schedule, and discuss concerns and proposed changes. He will coordinate response efforts and will develop our comprehensive IMP. The IMP will be based on extensive local knowledge of this segment of

I-81, and a thorough understanding of the available alternate routes. The IMP will focus on proactive measures to identify and locate incidents rapidly, quickly respond to them, clear those incidents, and implement planned detours in the event of a major incident.

**Figure 4.5.2-2: Elements of our Incident Management Plan**

-  A 24/7 point-of-contact for emergency notifications of incidents in the I-81 Project corridor.
-  A VDOT-approved emergency detour routes, sign layout plans, and TMP signage.
-  An Agency and Stakeholder Responsibilities Matrix that communicates needs and responsibilities.
-  Sign layout plans that show all pre-staged detour equipment and material needs for the Project.
-  Standard methods of communication with the VDOT SWRO TOC and other stakeholders.
-  Signing plans that provide emergency detour routes, crossovers, and access points.
-  An up-to-date listing of all revisions and updates that our team has made to the Design Concept plans.
-  A plan for communicating with all first responders and stakeholders in the I-81 Project corridor.
-  Plans that demonstrate access areas for law enforcement and first responders during incidents.
-  A listing of pre-planned messages to be shown on portable DMS boards during incidents.
-  A current contact list of all appropriate response personnel, which will be kept on-site at all times.

The IMP will leverage existing elements that VDOT has invested in along the corridor, including Safety Service Patrol (SSP), CCTV cameras for real-time traffic monitoring, and signal communication upgrades funded along the parallel routes.

When responding to incidents, David will coordinate with VDOT and local first responders to ensure rapid response times to incident sites and to quickly move disabled vehicles from the roadway. Response activities may include the temporary relocation of a car to the shoulder to allow traffic flow to commence immediately and then schedule a specific time to remove the vehicle from the Project site entirely. Emergency crossovers will be maintained, to allow law enforcement and other first responders to reach incident sites rapidly. These crossovers will be synced with all construction ingress/egress locations.

### Stakeholder Communication and Mitigation Strategies

The high traffic volumes during peak periods of travel combined with trucking routes and numerous residential communities, businesses, and the I-64 interchange area highlight the need for enhanced public communications during construction. For through traffic, notification of work zone traffic conditions, including lane restrictions and new travel patterns, is critical to maximizing safety. For local traffic utilizing intersecting streets and roadways, thorough advance communication for access and lane shifts or changes to access points is essential.

Public Relations Manager (PRM) **Mike Carosi** of OPT will develop and manage the team's comprehensive **Public Information and Communications Plan (PICP)**. Mike will meet with VDOT Communications Staff to coordinate communication efforts following Section 2.11 of Part 2 of the RFP. Our team will participate in weekly communication coordination meetings with the Corridor Wide Transportation Management communication team, starting immediately after receipt of the Notice to Proceed, and continuing through the design and construction phases in accordance with the RFP.

Our team recognizes that proactive communication with all stakeholders is essential to a successful TMP. As with any large-scale transportation improvement, some inconvenience is unavoidable, but our goal is to minimize these impacts. VDOT has already engaged in a public involvement process by hosting a Public Hearing for the I-81 Project. **Our team commits to continuing the robust public involvement that VDOT has started during design and construction.**

As detailed on the next page in **Figure 4.5.2-3**, we have identified the Project's stakeholders, determined how they will be impacted, and devised targeted communication and mitigation strategies to reduce these impacts.

### COMMUNICATION METHODS DURING CONSTRUCTION

Our team will utilize innovative geo-fence digital displays and geo-target paid social media strategies to effectively deliver awareness and communications. These proven public outreach strategies significantly expand audience reach by identifying motorists and commuters passing through the I-81 Project work zone and delivering tailored communications. Key messages can include a range of project-specific calls-to-action and messages specific to MOT. This will benefit the I-81 Project by creating an environment of awareness, enhancing safety, and avoiding delays. Communication methods can include:

- **Online Geo-Fence Digital Display:** This tactic targets motorists who pass through the I-81 Project corridor. This tactic will allow our team to capture mobile device IDs for message delivery to mobile browsers and apps. It also follows the mobile device to a home IP address and continues to target and deliver ads via multiple platforms, including tablets and home computers.
- **Geo-Target Paid Social Media:** Targets a defined radius to the I-81 Project corridor and delivers awareness through social media ads, driving engagement and public participation and input, through Facebook and Instagram (i.e., the radius target area can range as needed from 1 to 10 miles and incorporates target audience demographics, including industry verticals, professionals, and commuters).

These tactics can provide cost-effective, highly targeted audience reach (impressions) and can be used together in a campaign or individually. Geo-Target Paid Social Campaigns also can drive significant public engagement (e.g., clicks and click-through rates), which can be especially important for communicating MOT information in the I-81 Project work zone.

PRM **Mike Carosi** and his team at OPT have successfully implemented these approaches on similar highly traveled corridor projects, including the VDOT Improve I-95 Decide Before the Divide campaign, Route 9 Roundabouts – Traffic Calming Project in Loudoun County, the Military Highway Continuous Flow Intersection (CFI) in Norfolk, and the I-264/I-64 Pavement Rehabilitation D-B Project in Norfolk and Virginia Beach.

**Figure 4.5.2-3: Project Stakeholder Communication and Mitigation Strategies**

STAKEHOLDER	POTENTIAL IMPACTS	COMMUNICATION & MITIGATION STRATEGIES
<b>Traveling Public and Locals/ Residents</b>	<ul style="list-style-type: none"> <li>• Potential travel time delays for temporary operations.</li> <li>• Potential safety impacts.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct “Pardon Our Dust” meetings for the public, public safety officials, and other stakeholders throughout design and construction.</li> <li>• Conduct public information meetings as approved by VDOT for the public, public safety officials, and other stakeholders throughout design and construction.</li> <li>• PCMS devices will be utilized for public notices in accordance with the RFP.</li> <li>• Robust public outreach campaign in accordance with the RFP.</li> </ul>
<b>City of Staunton, FHWA, FEMA, USACE, DEQ, Buckingham Branch Railroad</b>	<ul style="list-style-type: none"> <li>• Project reviews and comments.</li> <li>• Coordination with adjacent projects.</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinate reviews and address all comments by the City of Staunton when directed by VDOT.</li> <li>• Operate as a liaison between VDOT and the City of Hampton to ensure compliance with local ordinances.</li> <li>• Operate as a liaison between VDOT, FHWA, FEMA, USACE, DEQ, and BBRR.</li> </ul>
<b>Local Businesses, Community Representatives, and the Media</b>	<ul style="list-style-type: none"> <li>• Potential access confusion during construction and after completion of the I-81 Project</li> </ul>	<ul style="list-style-type: none"> <li>• Access to all stakeholder properties always maintained as required by the RFP.</li> <li>• PCMS devices will be utilized for public notices.</li> <li>• Direct coordination with local businesses, community representatives, and corresponding media outlets.</li> <li>• Host community meetings one month before construction start and one month before construction end, as well as quarterly meetings with impacted business groups following the RFP.</li> <li>• Organize and host a Community Open House at a suitable nearby location to allow the public to meet the construction team, learn about the I-81 Project, and provide interactive activities for children.</li> </ul>
<b>Local Schools</b>	<ul style="list-style-type: none"> <li>• Potential delays to school buses/ transportation services</li> </ul>	<ul style="list-style-type: none"> <li>• Coordination of construction activities with university and local school staff.</li> <li>• Avoid lane closures during school bus operating hours when possible or major Virginia Tech events.</li> <li>• Advance notification of traffic pattern changes.</li> </ul>
<b>Police, Fire, and Rescue/ Ambulances and Local Hospitals/ Healthcare Facilities</b>	<ul style="list-style-type: none"> <li>• Potential response time impacts.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide 8-foot shoulders for incident management, police enforcement, and quicker response to incidents.</li> <li>• Advance notification of temporary lane restrictions and changes to traffic patterns. Representatives will be notified of approved lane closure requests.</li> <li>• Pre-traffic switch emergency responder meetings for response planning.</li> </ul>
<b>Coordination with Adjacent Projects</b>	<ul style="list-style-type: none"> <li>• Possible conflicting construction operations</li> </ul>	<ul style="list-style-type: none"> <li>• Utilization of a liaison to coordinate construction activities to avoid conflicts.</li> <li>• Seamless coordination with adjacent construction activities.</li> <li>• Monthly coordination meetings with other Contractors or as requested by VDOT.</li> <li>• Prioritizing scheduling activities for existing projects that have been awarded and emergency maintenance projects in accordance with the RFP.</li> </ul>



# 4.6

## Proposal Schedule



# SECTION 4.6 PROPOSAL SCHEDULE

## 4.6.1 PROPOSAL SCHEDULE

We prepared our Proposal Schedule, provided in “TAB 3” of Volume II, utilizing Primavera P6 software and Critical Path Method (CPM) scheduling to depict the scope and sequence of work to design and construct the Project per the RFP requirements. PDF copies of the Proposal Schedule and Narrative, as well as a backup copy of the Proposal Schedule’s source document, are provided in electronic file format.

## 4.6.2 PROPOSAL SCHEDULE NARRATIVE

Our team developed the following Proposal Schedule Narrative for the overall plan to execute the work. This Proposal Schedule Narrative includes an explanation of our overall sequencing, the Critical Path, our strategy to ensure successful delivery of the I-81 Project on time and within budget, and other key assumptions on which the Proposal Schedule is based. The narrative also explains how our team optimizes the benefits of the D-B delivery method to mitigate known risks, conform to MOT requirements, and minimize construction impacts on the public.

### Overall Sequence of Work

Our Proposal Schedule evaluates the I-81 Project in a total of three stages:

- 1. Design, Utilities, and Railroad Coordination, and Right-of-Way (ROW) Acquisitions:** The objective of this stage is to complete all Preliminary and Final Design for the I-81 Project, perform coordination with the Buckingham Branch Railroad (BBRR), resolve all utility conflicts, and perform ROW acquisitions.
- 2. Permitting:** The objective of this stage is to obtain all environmental permits from applicable agencies (e.g., Virginia Department of Environmental Quality [DEQ], US Army Corps of Engineers [USACE], Virginia Marine Resources Commission [VMRC]).
- 3. Construction:** The objective of this stage is to construct the entire I-81 Project. Activities include the VDOT inspection and acceptance of work, system testing, punch list, and closeout of the I-81 Project.

### Critical Milestones

Our team is committed to a **Final Completion Date of June 8, 2027**. Additionally, **Figure 4.6.2-1** identifies key

Figure 4.6.2-1: Key Milestone Dates

MILESTONE	DATE
Technical Proposal Submission	January 11, 2022
Price Proposal Submission	February 15, 2023
Opening of Price Proposals	February 20, 2023
D-B Contract Execution	April 7, 2023
Notice to Proceed	April 7, 2023
Scope Validation Period	April 7, 2023 to August 4, 2023
Mobilization	August 9, 2024
Final Completion	June 8, 2027

procurement dates, which will require coordination between our team and VDOT and others reviewing agencies, including, but not limited to, the City of Staunton, Augusta County, and the Federal Highway Administration (FHWA). Post-award, we will implement an assertive D-B approach, local experience, and relationships to improve these dates potentially.

### Work Breakdown Structure

Our Work Breakdown Structure (WBS) is a multi-level, hierarchical arrangement of the work performed on the I-81 Project. Our team has laid out the WBS to break down the major work segments of the I-81 Project. Work has been broken down by Permitting and Design, Scope Validation Period, Construction, and Milestones. The construction is further organized into each construction segments, including each bridge and roadwork section.

WBS areas for the I-81 Project were developed as a collaborative effort between the design and construction team by evaluating the components as a single project, including the type of work along the design of the alignment consideration and management of the construction efforts. An outline of our WBS is provided in this section, and a detailed breakdown follows on the next two pages in **Figure 4.6.2-2**.

**Figure 4.6.2-2: Work Breakdown Structure**

WBS CODE	WBS NAME
• 1.7	Permitting & Design
» 1.7.1	Design QA/QC Plan
» 1.7.13	Survey
» 1.7.2	Geotechnical
» 1.7.3	Environmental Permits
» 1.7.4	Utility Relocation/Coordination
» 1.7.15	Bridge
» 1.7.8	Shoulder Strengthening Work Package
» 1.7.9	MOT, Grading, Drainage, ESC/SWM & ROW Work Package
» 1.7.10	Right of Way (BBRR Easements)
» 1.7.11	Final Design
» 1.7.12	Pavement Marking/Signage Plans
» 1.7.14	Noise Wall
• 1.5	Scope Validation Period
» 1.3	Construction
» 1.3.8	Project Wide
• 1.3.10	Phase 1 Traffic Switch
» 1.3.10.8	Segment 1
- 1.3.10.8.4	Road Work SB Sta. 3079+50 to Sta. 3036+00
- 1.3.10.8.3	Road Work SB Sta. 3087+00 to Sta. 3082+00
» 1.3.10.9	Segment 2
- 1.3.10.9.6	Road Work NB Sta. 2218+00 to Sta. 2089+50
- 1.3.10.9.2	Road Work SB Sta. 3217+00 to Sta. 3090+00
» 1.3.10.10	Segment 3
- 1.3.10.10.7	Road Work NB Sta. 2244+00 to Sta. 2220+00
- 1.3.10.10.1	Road Work SB Sta. 3245+50 to Sta. 3220+00
- 1.3.10.10.5	Road Work SB Sta. 3036+00 to Sta. 3027+00
• 1.3.11	Phase 2 Traffic Switch
» 1.3.11.13	Segment 1
- 1.3.11.13.4	Road Work SB Sta. 3079+50 to Sta. 3036+00
- 1.3.11.13.3	Road Work SB Sta. 3087+00 to Sta. 3082+00
- 1.3.11.13.10	Mainline SB Bridge over Augusta Woods Drive/Buckingham Branch Railroad
- 1.3.11.13.9	Mainline SB Bridge Route 250
- 1.3.11.13.11	Mainline SB Bridge over I-64 Ramp 1
- 1.3.11.13.1	Ramp 1
» 1.3.11.14	Segment 2
- 1.3.11.14.6	Road Work NB Sta. 2218+00 to Sta. 2089+50
- 1.3.11.14.2	Road Work SB Sta. 3217+00 to Sta. 3090+00
- 1.3.11.14.7	Road Work NB Sta. 2244+00 to Sta. 2220+00
- 1.3.11.14.12	Mainline NB Bridge over Lewis Creek
- 1.3.11.14.8	Mainline SB Bridge over Lewis Creek
» 1.3.11.15	Segment 3
- 1.3.11.15.5	Road Work SB Sta. 3036+00 to Sta. 3027+00
- 1.3.11.15.1	Road Work SB Sta. 3245+50 to Sta. 3220+00
• 1.3.12	Phase 3 Traffic Switch

**Figure 4.6.2-2: Work Breakdown Structure (continued)**

WBS CODE	WBS NAME
» 1.3.12.13	Segment 1
- 1.3.12.13.5	Road Work SB Sta. 3036+00 to Sta. 3027+00
- 1.3.12.13.9	Mainline SB Bridge Route 250
- 1.3.12.13.10	Mainline SB Bridge over Augusta Woods Drive/Buckingham Branch Railroad
◇ 1.3.12.13.1	Phase 3A
◇ bid-1.3.12.13.1	Phase 3B
- 1.3.12.13.3	Road Work SB Sta. 3087+00 to Sta. 3082+00
- 1.3.12.13.4	Road Work SB Sta. 3079+50 to Sta. 3036+00
- 1.3.12.13.11	Mainline SB Bridge over I-64 Ramp 1
» 1.3.12.14	Segment 2
- 1.3.12.14.6	Road Work NB Sta. 2218+00 to Sta. 2089+50
- 1.3.12.14.2	Road Work SB Sta. 3217+00 to Sta. 3090+00
- 1.3.12.14.8	Mainline SB Bridge over Lewis Creek
- 1.3.12.14.12	Mainline NB Bridge over Lewis Creek
» 1.3.12.15	Segment 3
- 1.3.12.15.1	Road Work SB Sta. 3245+50 to Sta. 3220+00
- 1.3.12.15.7	Road Work NB Sta. 2244+00 to Sta. 2220+00
• 1.3.13	Phase 4 Traffic Switch
» 1.3.13.6	Project Closeout

**PROJECT MILESTONES**

This section of the Proposal Schedule contains the milestones for Contract Award, Design Complete, and Final Completion.

**PERMITTING & DESIGN**

This section of the Proposal Schedule includes the QA/QC plan and design milestones for surveying; geotechnical engineering; scope validation; environmental permitting; utility relocation and coordination; bridges, and noise analysis; ROW acquisitions; maintenance of traffic (MOT); grading; clearing and erosion and sediment control (E&SC) work package; sign/stripping design; intelligent transportation systems (ITS); bridge design; and roadway design. Submittal milestones and approvals by VDOT and governing agencies are included.

**PERMITTING & DESIGN: RIGHT OF WAY**

This section of the Proposal Schedule outlines and monitors the acquisition of easements, including title searches, appraisals and reviews, offers, negotiations, settlements, and filing certificates of take (COT) when needed. This section also shows the anticipated Right of Entry from the Railroad.

**PERMITTING & DESIGN: ENVIRONMENTAL**

This section of the Proposal Schedule includes stream assessment fieldwork and USM credit verification, wetland and stream delineations, jurisdictional determinations, permit management and preparation, mitigation, permit submission, Phase I and II Environmental Site Assessments (as required), and reviews from authorities that have jurisdiction.

**PERMITTING & DESIGN: UTILITY RELOCATION AND COORDINATION**

This section includes activities for Utility Field Inspection (UFI) meetings, completion of relocation designs, approval of relocation designs, and construction of utility relocations. Utility relocation is represented by a single activity as a placeholder and can be further developed.

**PERMITTING & DESIGN: GEOTECHNICAL**

This section contains all the geotechnical investigation and design activities including the geotechnical reports for each bridge, shoulder cut and fill slopes report, pavement widening validation report, minor structures culvert report, and all laboratory testing activities.

**DESIGN: BRIDGE**

This section contains all the bridge design sub-sections for each bridge for stage 1, and stage 2 final design with a sub-section for bridge maintenance and repair plans approval process.

**RAILROAD COORDINATION**

We will begin coordinating with Buckingham Branch Railroad (BBRR) upon receipt of a Notice to Proceed (NTP). We understand the importance of timely and routine railroad coordination to maintain schedule commitments. Our team will leverage existing relations when coordinating with BBRR to prioritize securing railroad agreements.

**CONSTRUCTION**

The following calendars were used in the development of our Proposal Schedule to represent a variety of scenarios:

- **Calendar 1, 5 Days, Standard Holiday, Weather Days:** Will be used for construction activities that are anticipated to be affected due to adverse weather conditions. The local average range of precipitation was considered while assuming this information.
- **Calendar 2, Seven-Day Calendar:** Will be assigned to activities with durations based on seven days per week without any holidays or adverse weather. This calendar will be used for review periods, fabrications, and milestones.
- **Calendar 3, Five-Day Work Week with Holidays:** Based on five working days per week, all design, administrative, and construction activities are used except those impacted by adverse weather and holiday restrictions.
- **Calendar 4, 5 Days, Standard Holiday, Weather Days, Paving:** Same as weather calendar with a blocked out non-work period from December 15 – March 15.

Our team has reviewed the weather data provided by the NOAA observation center located in Staunton, Virginia for weather analysis. **Figure 4.6.2-3** below provides the number of weather days, by respective months, that our Proposal Schedule considers for inclement weather. We will observe all holidays listed in Part 5, Section 108.02 (Limitation of Operations) in the *VDOT 2020 Road and*

*Bridge Specifications.*

**Overall Plan and Strategy**

Our team will develop a comprehensive plan to complete the I-81 Project promptly and professionally. Our goal is to minimize the number of construction phases, traffic pattern changes, and interruptions to the traveling public. We will coordinate MOT staging for smooth transitions between the bridge and roadway construction operations.

We will strategically divide design and construction into five bridges and three roadway geographic construction segments. Our segmentation of the I-81 Project allows the design for each bridge to be developed concurrently with minimal schedule dependency on the other bridges and roadway and a high level of coordination between each. Design packages for each segment will be submitted to VDOT for review following the RFP requirements and Approved for Construction (AFC) design completion stage, ensuring comprehensive VDOT oversight while maintaining design progress.

Our Proposal Schedule incorporates all phases of design including preparation, design QA/QC reviews, and submission of roadway, ROW, drainage, stormwater management, E&SC, MOT, signing, pavement marking, signal, lighting, ITS, and bridge plans at multiple stages of the design process including a 21-calendar day activities for VDOT review/approval with each submission.

The design phase also includes activities for completion of surveys, utility designations, noise studies, utility relocations, the Scope Validation Period, and geotechnical investigations. We will begin the design immediately upon receipt of a NTP to secure an early start on roadway and bridge plans, temporary traffic control, and the ROW acquisition.

**Environmental and Permitting**

Identifying recognized environmental conditions/areas of concern (AOCs) early in the design process will facilitate the timely issuance of environmental permits. Additionally, consistent communication within our team and resource agencies will help mitigate risk to the I-81 Project Schedule. Our approach during design will include the following elements.

**Figure 4.6.2-3: Anticipated Weather Days**

# OF ANTICIPATED WEATHER DAYS	MONTH											
	J	F	M	A	M	J	J	A	S	O	N	D
	3	3	3	4	3	4	4	4	2	3	5	4

Upon receipt of an NTP, our team will refine environmental resource locations in the I-81 Project corridor based on the Design Concept. Fieldwork and technical services will be performed as necessary and may include stream review and assessment, threatened and endangered (T&E) species reviews and survey, ESAs, asbestos/lead inspections on structures, and final noise analysis for permitting and environmental compliance monitoring.

If our refinement identifies unanticipated or unknown resources, our Design Concept will be modified to support avoidance and/or minimization opportunities. Our team will coordinate with the appropriate resource agencies to ensure resource protection of new resources identified. We will also review the environmental commitments included in the RFP, the Categorical Exclusion (CE), and other documentation and incorporate each into the Final Design.

## Adhering to Cultural Resource Commitments

Because our team's Design Concept remains within the RFP Conceptual Design's footprint, the previously concluded Section 106 effect determination that no historic properties are present or affected should remain valid. Our team will consider the four identified historic properties listed as eligible or potentially eligible to be design constraints and avoid impacting them beyond what is included in the RFP Conceptual Design. These properties include the C&O Railroad, J. Stacy Palmer Farm, an open-air terrestrial archaeological site beyond the northern limits of the I-81 Project, and the DeJamette State Sanatorium.

We understand that any changes beyond the RFP Design may require additional cultural resources studies or coordination with the Virginia State Historic Preservation Office.

## Protection of Threatened and Endangered Species

Our team has reviewed the T&E species studies and coordination conducted by VDOT. The preliminary T&E Species Clearance Form (dated September 12, 2022) identified six state/federally listed T&E species, including the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), Madison Cave isopod (*Antrilana lira*), loggerhead shrike (*Lanius ludovicianus*), little brown bat (*Myotis lucifugus*), and tri-colored bat (*Perimyotis subflavus*). Based on database reviews as well as surveys our team is planning work schedules outside of potential habitat during likely time-of-year

restrictions to avoid impacts with threatened and endangered species.

The T&E Species Clearance Form stated that the proposed I-81 Project might affect, but is not likely to adversely affect, the loggerhead shrike, Indiana bat, and northern long-eared bat and will have no adverse impacts on the little brown bat and the tri-colored bat. However, VDOT's August 2022 acoustic survey for T&E bats did not detect the presence of any T&E species, including Indiana bats, northern long-eared bats, or tri-colored bats.

The I-81 Project is not located within buffers of known hibernaculum for northern long-eared, Indiana, little brown, and tri-colored bats. Additionally, the May and June 2022 bat inventories found no evidence of T&E bats roosting on the bridges.

Our team is aware of the up-listing of the northern long-eared bat from a federally threatened to endangered species (effective January 30, 2023) and the up-listing of the tri-colored bat to a federally endangered species (anticipated in September of 2023). Based on the absence of bat species identified in the survey, no time-of-year restriction for tree cutting is currently required. However, with species up-listing occurring, our team is prepared to conduct bridge/structure inventories, surveys, and coordination as needed for clearance and permit acquisition.

To expedite the construction timeline, avoid delays, and reduce construction costs, **we are adjusting the I-81 Project's construction sequence to avoid cutting trees greater to or equal to 3-inches diameter at breast height (DBH) from April 1 through November 14, 2023, to avoid conflicts with listed bat species.** Additionally, upon NTP, our team will update T&E species reviews to confirm that the I-81 Project complies with special provisions and state and federal requirements.

Based on this, our team is confident that any regulatory changes in T&E listings could be avoided or mitigated through sequencing work so tree clearing could be conducted outside the required time-of-year restrictions. Upon receipt of an NTP, our team will continue coordination with natural resource and regulatory agencies to ensure compliance with species protections.

## Secure Water Quality Permits

The RFP Conceptual Design and our Design Concept are estimated to impact approximately 0.38 acres (AC) of wetlands and 660 feet of streams. After receipt of an NTP, we will continue to look for additional ways to improve our Design Concept to avoid further impacts.

The I-81 Project will require authorization under a USACE Nationwide Permit 23 (up to 1,000 LF and 0.5 acres of wetlands) with an approved Categorical Exclusion (CE). The I-81 Project includes two crossings over Lewis Creek and, as those locations have a drainage area greater than 5 square miles, will require a Virginia Marine Resources Commission (VMRC) VGP-1 Permit.

Our team will avoid and minimize impacts to streams and wetlands to the greatest extent practical. All construction impacts will be mitigated by purchasing wetlands and stream credits from approved mitigation banks or in-lieu programs.

### Right of Way Acquisitions

ROW activities are critical to the success of the I-81 Project and the schedule. Our Proposal Schedule details the acquisition process for the required easements, including title research, appraisals, offers, and negotiations. Except for permanent utility easements (yet to be identified) and possible temporary construction easements, our team proposes that the Project alignment will be contained within the ROW limits shown on the RFP Plans. To that extent, we will advance the acquisitions following the guidelines established by VDOT and other Commonwealth and federal guidelines.

Acquisitions provided in the Proposal Schedule mirror the process provided by the guidelines. Preliminary activities such as title exams, preliminary appraisals, and preliminary reports can begin before VDOT's NTP for ROW acquisition. Once VDOT's Notice to Commence Acquisition is received, durations and interaction times are tightly controlled by the Guidelines which require notice durations, minimum response times, and VDOT review and payment processing durations. The ROW and Utilities Management System (RUMS) reporting system is updated throughout the entire Project.

### Utilities in the I-81 Project Corridor

Sections 4.3.1.1(g) and 4.4.2 provide a portion of anticipated utility relocations and potential conflicts for the Project. The utility companies that have been identified as having facilities in the I-81 Project area include Shentel (STC), Comcast (CMC), Dominion Power (DOM), Shenandoah Valley Electric Cooperative (SVE), Lumos Networks/Segra (LMS), Columbia Gas of Virginia (CGV), Buckingham Branch Railroad (BBR), Augusta County Service Authority (ASA), City of Staunton (STA), Verizon (VZN), and VDOT.

Mitigation strategies to confirm the timely relocation of the facilities found to be in conflict will start with

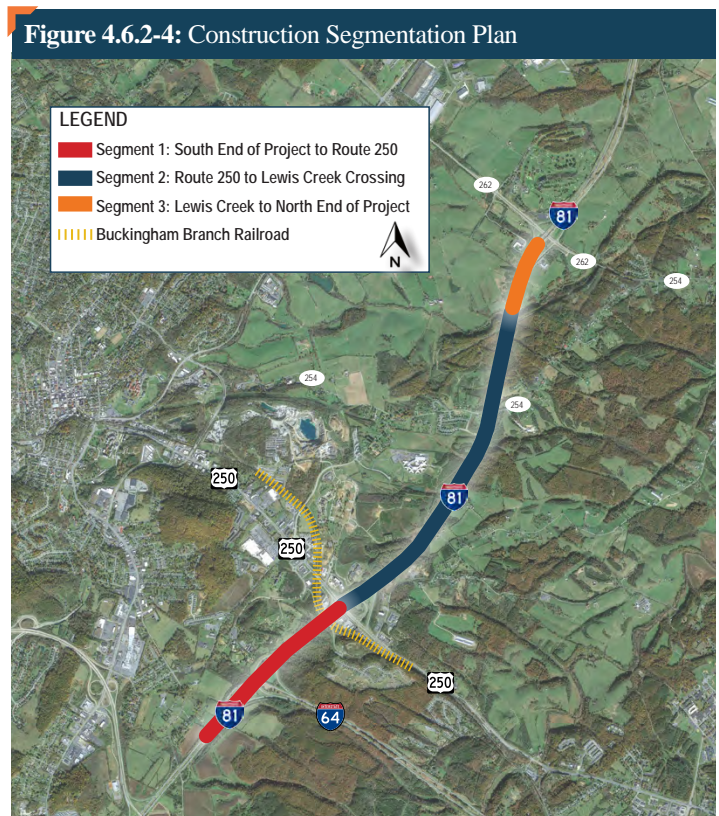
consistent communication with the utility contacts to remind them of their schedule commitments, and to that they have their preliminary steps underway to complete the work. A detailed Utility Matrix is provided behind "TAB 2" of Volume.

### Overall Construction of the Project

Our overall construction plan was developed through an intimate knowledge of the local area. As demonstrated below in **Figure 4.6.2-4**, construction operations are organized logically and systematically into three Project segments, each containing relatively similar scopes of work and shorter activity durations. This Project breakdown provides phasing flexibility and will allow the team to advance to the next segment when the previous segment is completed. We will perform work within each segment concurrently to achieve a Final Completion Date of June 8, 2027.

Our approach simplifies construction and enhances schedule flexibility to ensure on-time, on-budget delivery of the I-81 Project. Our Design Concept has refined MOT processes with fewer construction phases and minimal traffic switches, resulting in fewer accidents and improving driver expectancy.

A high-level explanation of critical elements of work for each of the proposed construction activities follows in this section.



## **CRITICAL PATH**

As demonstrated in **Figure 4.6.2-5** at the end of this section, we have identified a clear critical path while developing the proposal schedule. The critical path highlights the importance of early coordination and continued communication with utility owners to expedite necessary relocations. Our detailed Proposal Schedule is also included behind "TAB 3" in Volume II.

- Critical activities will be identified during the design stage and allocate necessary resources before assigning resources to non-critical activities.
- Critical activities will be highlighted and communicated to all Project stakeholders and regulatory authorities during any design review and approval process. We will also address comments as promptly as possible.
- The Construction QA/QC Team will play a part in critical path management by making timely decisions related to critical activities.
- The team will apply lessons learned and complete critical activities early or on schedule.
- The schedule and progress of each critical and near-critical activity will be monitored throughout the duration of the Project.

## **KEY ASSUMPTIONS**

In addition to the calendars and weather days, our team made the following key assumptions, on which the Proposal Schedule is based:

- **Partnering and Coordination:** Effective partnering and coordination efforts between our team and VDOT, Augusta County, the City of Staunton, and all other stakeholders.
- **Submittal Review Time:** Our team will make timely and complete plan submittals to VDOT. All dates provided in our Proposal Schedule rely on prompt reviews by VDOT.
- **Weather Impacts:** Our team used weather data from the NOAA Station in Staunton, Virginia to estimate the weather impact throughout the year. This data will provide a reliable estimate for standard weather impact.
- **Utility Relocations:** Utility companies will schedule relocation efforts based on the Proposal Schedule.
- **Activity Durations:** All durations are based on an eight-hour workday and a five-day workweek.

## **SCHEDULE MANAGEMENT AND MITIGATION OF DELAY RISK**

Effective management and control of a project requires a properly managed scheduling program, documentation

control, cost control, and an integrated design-to-construction process. Our team developed the Proposal Schedule following the requirements of the RFP. We will use Primavera P6 (P6) scheduling software to plan, schedule, and monitor the I-81 Project. The Project Schedule will be developed, maintained, and updated by the Project Scheduler. The Project Scheduler, supported by Construction Manager **Greg Suttle** and DBPM **Jim Kreider, PE**, is ultimately responsible for managing the Project Schedule.

Upon receipt of an NTP, our team will collaborate with VDOT to develop a detailed Baseline Schedule using the Design Concept plans. Following an internal analysis and review of the general schedule logic and Critical Path, the baseline schedule will be submitted for approval. The Project Controls Team will generate the Baseline Schedule document, as required, for submission to VDOT.

When changes or unforeseen circumstances arise that impact the Project Schedule, we will notify VDOT (and other appropriate stakeholders) and begin incorporating changes into the "live" CPM Schedule. If any changes result in schedule slippage, the DBPM will evaluate the issue to determine if additional manpower, equipment, multiple shifts, a change in subcontractor, or other subcontractors are required. If so, the necessary resources will be mobilized to correct the slippage and maintain the Project Schedule. The Project Schedule will be communicated to all involved parties throughout the duration of the I-81 Project.









# Appendices



# Appendix 4.0.1.1

## Technical Proposal Checklist

**ATTACHMENT 4.0.1.1**

**I-81 WIDENING MM 221 to MM 225**

**Contract ID No. C00116269DB116**

**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

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

<b>Technical Proposal Component</b>	<b>Form (if any)</b>	<b>RFP Part 1 Cross Reference</b>	<b>Included within page limit?</b>	<b>Technical Proposal Page Reference</b>
<b>Technical Proposal Checklist and Contents</b>	Attachment 4.0.1.1	Section 4.0.1.1	no	Appendix 4.0.1.1
<b>Acknowledgement of RFP, Revisions, and/or Addenda</b>	Attachment 3.6 (Form C-78-RFP)	Sections 3.6, 4.0.1.1	no	Appendix 3.6
<b>Letter of Submittal</b>	NA	Sections 4.1		Page 1
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	Page 1
Identify the full legal name and address of Offeror	NA	Section 4.1.1	yes	Page 1
Authorized representative's original signature	NA	Section 4.1.1	yes	Page 1
Declaration of intent	NA	Section 4.1.2	yes	Page 1
120 day declaration	NA	Section 4.1.3	yes	Page 1
Point of Contact information	NA	Section 4.1.4	yes	Page 1
Principal Officer information	NA	Section 4.1.5	yes	Page 1
Final Completion Date	NA	Section 4.1.6	yes	Page 1
Unique Milestone Date(s)	NA	Section 4.1.7	yes	Page 1
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.8	no	Appendix 9.31
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	Section 4.1.9	no	Appendix 11.8.6

**ATTACHMENT 4.0.1.1**

**I-81 WIDENING MM 221 to MM 225**

**Contract ID No. C00116269DB116**

**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

<b>Technical Proposal Component</b>	<b>Form (if any)</b>	<b>RFP Part 1 Cross Reference</b>	<b>Included within page limit?</b>	<b>Technical Proposal Page Reference</b>
Written Statement to Achieve 6% DBE Goal	NA	Section 4.1.10		Page 1
Confirmation of SCC and DPOR from SOQ	NA	Section 4.1.11		Page 1
<b>Offeror's Qualifications</b>	NA	Section 4.2		Pages 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	Page 2
Deputy Key Personnel	Attachment 4.2.1	Section 4.2.1	no	Appendix 4.2.1
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.1	yes	Page 3
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.1	yes	Page 2
<b>Design Concept</b>	NA	Section 4.3		Pages 4-15
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	Page 4
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	Page 12
<b>Project Approach</b>	NA	Section 4.4		Pages 16-31
Environmental Management	NA	Section 4.4.1	yes	Page 16
Utilities	NA	Section 4.4.2	yes	Page 21

**ATTACHMENT 4.0.1.1**

**I-81 WIDENING MM 221 to MM 225**

**Contract ID No. C00116269DB116**

**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

<b>Technical Proposal Component</b>	<b>Form (if any)</b>	<b>RFP Part 1 Cross Reference</b>	<b>Included within page limit?</b>	<b>Technical Proposal Page Reference</b>
Geotechnical	NA	Section 4.4.3	yes	Page 23
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	Page 27
<b>Construction of Project</b>	NA	Section 4.5		Pages 32-41
Sequence of Construction	NA	Section 4.5.1	yes	Page 32
Transportation Management Plan	NA	Section 4.5.2	yes	Page 37
<b>Proposal Schedule</b>	NA	Section 4.6		Pages PS-1 - 12
Proposal Schedule	NA	Section 4.6.1	no	Page PS-1 & Volume II
Proposal Schedule Narrative	NA	Section 4.6.2	no	Page PS-1
Proposal Schedule in electronic format	NA	Section 4.6	no	Provided as Required

# Appendix 3.6

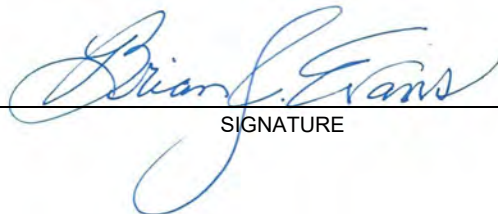
Form C-78-RFP (Acknowledgement  
of Receipt of RFP, Revisions, and/or  
Addenda)

**ATTACHMENT 3.6****COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION**RFP NO. C00116269DB116PROJECT NO.: 0081-007-013**ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA**

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 3.6, 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 – October 19, 2022  
(Date)
2. Cover letter of Addendum No. 1 – November 8, 2022  
(Date)
3. Cover letter of Addendum No. 2 – November 22, 2022  
(Date)
4. Cover letter of Addendum No. 3 – December 20, 2022  
(Date)
5. Cover letter of Addendum No. 4 – January 13, 2023  
(Date)



SIGNATURE

January 20, 2023

DATE

Brian Evans

PRINTED NAME

Senior Vice President

TITLE



# Appendix 4.2.1

Deputy Key Personnel Resumes

**ATTACHMENT 4.2.1**



**DEPUTY KEY PERSONNEL RESUME FORM**

<b>Brief Resume of Key Personnel anticipated for the Project.</b>						
a. Name & Title: <b>Justin Campbell, PMP   Project Manager</b>						
b. Project Assignment: <b>Deputy Design-Build Project Manager</b>						
c. Name of the Firm with which you are employed at the time of submitting Technical Proposal: <b>Branch Civil, Inc. (Full Time)</b>						
d. Employment History: With this Firm <u>12</u> Years With Other Firms <u>4</u> Years Please list chronologically (most recent first) your employment history, position, general responsibilities, and duration of employment for the last fifteen (15) years. (NOTE: If you have less than 15 years of employment history, please list the history for those years you have worked. Project specific experience shall be included in Section (g) below):  <b>Branch Civil, Inc.   Project Manager   2012 – Present</b> Justin is responsible for oversight and direction of the company's project activities. As a Project Manager he manages the construction process. He leads safety processes on construction sites and is responsible for document control and tracking. He is also responsible for performing quality control (QC) administration, plan quantity takeoffs, specification reviews, and contract administration. On construction sites, he is responsible for field operation and survey planning, project budgeting, material procurement, and owner, subcontractor, and supplier management and relations. He oversees the overall project schedule and estimating, and manages pre-activity meeting coordination, site logistics, change order pricing, and negotiations. He also trains and coaches project staff members.  <b>Kiewit Infrastructure South Co.   Superintendent   2007 – 2012</b> Justin was responsible for oversight and direction of the company's project activities. As a Superintendent his responsibilities included: scheduling, managing, and executing the field operations (crews, equipment, and subcontractors); leading and training crews on safe operations and safe behaviors on construction sites; planning and scheduling site logistics coordination for material deliveries; QC field coordination; plan quantity take-offs; specification reviews; contract administration; field operation and survey planning; time studies and scope method analysis; owner, subcontractor, and supplier management and relations; pre-activity meeting coordination; and change order pricing. He was also responsible for training, developing, and coaching project engineers and foremen.  <table border="1"><tr><th colspan="3">SUMMARY OF RELEVANT EXPERIENCE</th></tr><tr><td><ul style="list-style-type: none"><li>16 years of transportation construction experience.</li><li>Experience working as a Deputy DBPM on a VDOT interstate roadway widening project.</li></ul></td><td><ul style="list-style-type: none"><li>Direct experience working alongside DBPM, Jim Kreider, PE on a VDOT DB project.</li><li>Experience managing the design and construction elements of a DB project.</li></ul></td><td><ul style="list-style-type: none"><li>Significant knowledge of VDOT's requirements for QA/QC for DB projects.</li><li>Experience working with WRA on VDOT D-B projects</li></ul></td></tr></table>	SUMMARY OF RELEVANT EXPERIENCE			<ul style="list-style-type: none"><li>16 years of transportation construction experience.</li><li>Experience working as a Deputy DBPM on a VDOT interstate roadway widening project.</li></ul>	<ul style="list-style-type: none"><li>Direct experience working alongside DBPM, Jim Kreider, PE on a VDOT DB project.</li><li>Experience managing the design and construction elements of a DB project.</li></ul>	<ul style="list-style-type: none"><li>Significant knowledge of VDOT's requirements for QA/QC for DB projects.</li><li>Experience working with WRA on VDOT D-B projects</li></ul>
SUMMARY OF RELEVANT EXPERIENCE						
<ul style="list-style-type: none"><li>16 years of transportation construction experience.</li><li>Experience working as a Deputy DBPM on a VDOT interstate roadway widening project.</li></ul>	<ul style="list-style-type: none"><li>Direct experience working alongside DBPM, Jim Kreider, PE on a VDOT DB project.</li><li>Experience managing the design and construction elements of a DB project.</li></ul>	<ul style="list-style-type: none"><li>Significant knowledge of VDOT's requirements for QA/QC for DB projects.</li><li>Experience working with WRA on VDOT D-B projects</li></ul>				
e. Education: Name & Location of Institution(s)/Degree(s)/Year/Specialization: <b>East Carolina University – Greenville, NC   BS   2006   Construction Management</b>						
f. Active Registration: Year First Registered/ Discipline/VA Registration #: <b>2022   Project Management Professional   National Designation, #3240752</b> <b>2019   Intermediate Work Zone Traffic Control Training and Flagging Certification   Virginia (Expires February 2023)</b> <b>2005, 2015   OSHA 30-Hour Training Course, National Designation (no expiration)</b>						
g. Document the extent and depth of your experience and qualifications relevant to the Project. <ol style="list-style-type: none"><li>Note your role, responsibility, and specific job duties for each project, not those of the firm.</li><li>Note whether experience is with current firm or with other firm.</li></ol>						

3. Provide beginning and end dates for each project; projects older than fifteen (15) years will not be considered for evaluation.

**(List only three (3) relevant projects for which you have performed a similar function. On-call contracts with multiple task orders (on multiple projects) should not be listed as a single project.**

**1. I-95 Express Lanes Fredericksburg Extension (FredEx) Design-Build, Stafford County, Virginia**

**Branch Civil, Inc., Deputy Design-Build Project Manager, 2021 - Current (Client: Transurban/VDOT)**

**Roles and Responsibilities:** As the Deputy DBPM, Justin directly reports to DBPM Jim Kreider, PE to manage the construction of this \$400M D-B project, which extends the I-95 Express Lanes approximately 10 miles south of Route 610 (Garrisonville Road) in Stafford County to the vicinity of Route 17 (I-95 Exit 133). The project includes the construction of seven bridges, several of which impacted environmentally sensitive areas, and two reversible high-occupancy toll lanes and associated tolling gantries built in the existing median of I-95. When complete, the roadway will present a greater variety of travel options, including increased attractiveness of rideshare and transit use and a bypass option for vehicles with multiple occupants. Justin works alongside Jim in managing subcontractors and self-performed work, schedules crews, orders materials, ensures quality control in all aspects of construction and generates and analyzes monthly job cost status reports. He also aids in the maintenance of the project's CPM schedule, negotiates owner change order work, and prepares monthly owner reports and payment applications. He is actively involved in public relations efforts for the project, prepares and distributes notices for lane closures and major traffic shifts, and assists in developing presentations at public meetings for residents affected by construction. He assists VDOT in responding to any concerns or issues brought up by the residents. **Similarities/Relevance to the I-81 Project: Deputy DBPM on a D-B project for VDOT; interstate corridor; median and outside widening; bridge and structure construction; ROW acquisition; ITS; MOT challenges; stakeholder and public involvement; geotechnical challenges; utility coordination and relocations; project management.**

**2. I-64 Widening Exits 200 to 205 Design-Build, Henrico and New Kent County, Virginia**

**Branch Civil, Inc., Assistant Construction Manager, 2017 - 2018 (Client: VDOT)**

**Roles and Responsibilities:** Justin was responsible for assisting with the management of the construction process. He oversaw all QC activities to ensure the materials used and work performed meet contract requirements and the construction plans and specifications. This project improved the serviceability and safety of the I-64 corridor for the traveling public by widening the existing roadway while maintaining the existing travel lanes and access to the DMV weigh station. The scope included widening/adding a new inside lane of traffic and shoulder of both EB and WB I-64 for approximately 3.8 miles and widening two existing bridges over the Chickahominy River. Construction activities included asphalt pavement, grading, new drainage, roadway lighting at EB and WB weigh stations, ramp extensions, and access tunnel modifications, ITS system updates and re-routing, roadway signing (overhead and post-mounted), bridge pier protection barriers, box culvert extensions, mechanically stabilized earth (MSE) walls, rehabilitation to the two existing bridges as well as repairs to the existing substructure, superstructure, and replacement of existing decks, and construction of 1.25 miles of noise barrier walls on I-64 WB. **Similarities/Relevance to the I-81 Project: D-B project for VDOT with WRA as the Lead Designer; interstate corridor roadway improvements; median widening; bridge rehabilitation and structure reconstruction; ROW acquisition; ITS; MOT challenges; stakeholder and public involvement; geotechnical challenges; utility coordination and relocations; project management.**

**2. I-95 Safety Improvement at Route 3 Design-Build, Fredericksburg, Virginia**

**Branch Civil, Inc., Assistant Construction Manager, 2017 (Client: VDOT)**

**Roles and Responsibilities:** Justin assisted with managing the construction process on this \$19M D-B project. His responsibilities included QC activities to ensure the materials used and work performed met contract requirements and the construction plans and specifications. This roadway safety improvements project involved widening I-95 SB off-ramp, I-95 NB on-ramp along with a collector/distributor lane for a future project, adding a three-lane left turn intersection from Route 3 EB to the I-95 NB on-ramp and demolition/closure of the existing Route 3 on-ramp to I-95 NB. The project included excavation/balance of 70,000 CY of earthwork, 3,000 LF of new storm drainage, 11,000 LF of new underdrain, two new signalized intersections and modifications to an existing one, new roadway signage (overhead and post-mounted), 2,500 LF of new noise barrier walls, and coordination of utility relocations (communications, gas, water, and sanitary sewer). **Similarities/Relevance to the I-81 Project: D-B project for VDOT with WRA as the Lead Designer; interstate corridor roadway improvements; median widening; ROW acquisition; ITS; MOT challenges; stakeholder and public involvement; geotechnical challenges; utility coordination and relocations; project management.**



**ATTACHMENT 3.3.1**

**DEPUTY KEY PERSONNEL RESUME FORM**

<b>Brief Resume of Key Personnel anticipated for the Project.</b>		
Name & Title: <b>Andrew Koser, PE, Associate</b>		
Project Assignment: <b>Deputy Design Manager (DDM)</b>		
a. Name of the Firm with which you are employed at the time of submitting SOQ.: <b>Whitman, Requardt &amp; Associates, LLP (Full Time)</b>		
b. Employment History: With this Firm <u>14</u> Years With Other Firms <u>5</u> Years Please list chronologically (most recent first) your employment history, position, general responsibilities, and duration of employment for the last fifteen (15) years. (NOTE: If you have less than 15 years of employment history, please list the history for those years you have worked. Project specific experience shall be included in Section (g) below):		
<b><u>Whitman, Requardt &amp; Associates, LLP (WRA), Associate (2008 – Present)</u></b> Andrew is primarily responsible for managing and designing transportation projects in western Virginia. He serves as a DM on a design-build (D-B) project and as project manager and lead design engineer on transportation projects in the region. His work has included both large and small projects and has included work on many interstate projects including several D-Binterstate projects.		
<b><u>Anderson and Associates (A&amp;A) (2008)</u></b> Andrew worked on a variety of transportation projects during his limited time with Anderson and Associates.		
<b><u>JMT, (2001 – 2007)</u></b> Andrew worked primarily as a design engineer for various large and small transportation projects in both urban and rural areas.		
<b>SUMMARY OF RELEVANT EXPERIENCE</b>		
<ul style="list-style-type: none"> <li>• 19 years of progressive engineering experience.</li> <li>• Extensive knowledge of VDOT policies and procedures</li> <li>• Significant transportation design expertise</li> </ul>	<ul style="list-style-type: none"> <li>• Interstate widening experience</li> <li>• Experience on several projects along the I-81 corridor.</li> <li>• Management of multiple engineering disciplines</li> </ul>	<ul style="list-style-type: none"> <li>• Significant Design-Build Experience.</li> <li>• Experience working with Branch on VDOT D-B projects.</li> </ul>
c. Education: Name & Location of Institution(s)/Degree(s)/Year/Specialization: <b>The Pennsylvania State University, State College, Pennsylvania / Bachelor of Science / 1999 / Civil Engineering</b>		
d. Active Registration: Year First Registered/ Discipline/VA Registration #: <b>2008 / Professional Engineer / Virginia / #0402045425</b>		
e. Document the extent and depth of your experience and qualifications relevant to the Project. 1. <i>Note your role, responsibility, and specific job duties for each project, not those of the firm.</i> 2. <i>Note whether experience is with current firm or with other firm.</i> 3. <i>Provide beginning and end dates for each project; projects older than fifteen (15) years will not be considered for evaluation.</i> <b>(List only three (3) relevant projects* for which you have performed a similar function. If additional projects are shown in excess of three (3), the SOQ may be rendered non-responsive. In any case, only the first three (3) projects listed will be evaluated.)</b> <i>* On-call contracts with multiple task orders (on multiple projects) may not be listed as a single project.</i>		

**1. Route 58 Lover's Leap PPTA/Design-Build, Patrick County, Virginia**

**WRA, Design Manager, 2020 – Current (Client: VDOT)**

**Roles and Responsibilities:** This challenging 7.4 mile, \$300M project constructs improvements to the US Route 58 Corridor from Stuart to Hillsville and presents many challenges, including the construction of retaining walls, large drainage structures, two truck escape ramps, and numerous environmental impacts, including more than five miles of streams. As Design Manager, Andrew works directly with Branch as the Lead Contractor and WRA's Design Team to deliver a design that meets VDOT's requirements. Andrew has led the team of engineers, surveyors, environmental scientists, ROW acquisition specialists, and designers working to deliver the project in three main segments. Andrew developed a project-specific design QA-QC plan and has overseen the design QA-QC on the project. As Design Manager, Andrew has led numerous meetings for Branch with VDOT to coordinate design efforts and delivery with VDOT expectations. *Similarities/Relevance to the I-81 Project: D-B project for VDOT with Branch as the Prime Contractor; MOT; structure construction; hydraulics; environmental/permitting; geotechnical challenges; utility coordination and relocations; ROW acquisition; QA/QC.*

**2. I-64 Widening Exits 200 to 205 Design-Build, Henrico and New Kent County, Virginia**

**WRA, Design Engineer, 2017 - 2019 (Client: VDOT)**

**Roles and Responsibilities:** Andrew was responsible for developing much of the roadway design and maintenance of traffic design for this \$48M VDOT D-B project, which included 4.5 miles of improvements to the existing I-64, widening and rehabilitation of the existing two-lane bridges over the Chickahominy River with three-lane bridges in each direction. The I-64 bridges are approximately 263' long, utilized concrete beams, and were supported by concrete piles. I-64 was widened to the median in order to provide additional capacity from I-295 to the Bottoms Bridge exit. A very detailed MOT plan and TMP were required as part of the project and were delivered as an advanced work package to facilitate the initial construction operations and advance the schedule for the project. *Similarities/Relevance to the I-81 Project: D-B project for VDOT with Branch as the Prime Contractor; MOT in an interstate corridor; median roadway widening; bridge and structure construction; box culverts; geotechnical challenges; QA/QC.*

**1. I-81 Bridge Replacement over Route 11 Middle Fork Holston River, and Norfolk Southern Railroad, Smyth County, Virginia**

**WRA, Lead Roadway Engineer, 2016 - 2018 (Client: VDOT)**

**Roles and Responsibilities:** Andrew was responsible for designing roadway and maintenance of traffic (MOT) elements of this \$30M VDOT D-B project that replaced two bridges on I-81 over Route 11, Middle Fork Holston River, and Norfolk Southern Railroad in Smyth County, Virginia. He was responsible for not only the roadway and MOT design but also for coordination with both the hydraulic and bridge designs. He ensured that the roadway design conformed with contract requirements. He also assembled the design QA-QC plan and administered the design QA-QC plan on the project. This project was constructed within an existing ROW, which required a complex MOT plan utilizing the existing median to temporarily carry northbound and southbound traffic while the existing bridges were replaced. The efficient design replaced twin five-span, bridges with a single 410' three-span structure utilizing a micropile pier configuration. Andrew worked within an aggressive design schedule that included submitting the Stage 1 Bridge report to VDOT at the Kick-Off Meeting. *Similarities/Relevance to the I-81 Project: De-facto DDM role on a D-B project for VDOT in the I-81 Corridor; MOT in an interstate corridor; roadway improvements; surveying; bridge and structure construction; stakeholder and public involvement; environmental/permitting; hydraulics; geotechnical challenges; utility coordination and relocations; QA/QC; CEI; project management.*

f. For Key Personnel required to be on-site full-time for the duration of construction, provide a current list of assignments, role, and the anticipated duration of each assignment.

**Not applicable for this position**

# Appendix 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 20 day of January, 2023, by and between the Virginia Department of Transportation (“VDOT”), and Branch Civil, Inc. (“Offeror”).

**WITNESSETH:**

**WHEREAS**, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s October 19, 2022 Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the **I-81 Widening MM 221 to MM 225, Project No. 0081-007-013** (“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 **one hundred twenty thousand and 00/100 Dollars (\$120,000.00)** ("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: \_\_\_\_\_

BRANCH CIVIL, INC.

By:  \_\_\_\_\_

Name: Brian Evans

Title: Senior Vice President

# Appendix 11.8.6

Certification Regarding Debarment;  
Primary and Lower Tier Covered  
Transactions

**ATTACHMENT 11.8.6(a)**  
**CERTIFICATION REGARDING DEBARMENT**  
**PRIMARY COVERED TRANSACTIONS**

**Project No.: 0081-007-013**

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.

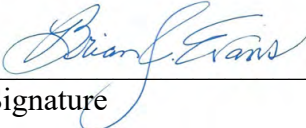
b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under 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.

	January 20, 2023	Senior Vice President
Signature	Date	Title

Branch Civil, Inc.  
\_\_\_\_\_  
Name of Firm

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

**Project No.: 0081-007-013**

- 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.



12/13/2022

Vice President

Signature

Date

Title

Whitman Requardt & Associates, LLP

Name of Firm

**ATTACHMENT 3.2.7(b)**

**CERTIFICATION REGARDING DEBARMENT**  
**LOWER TIER COVERED TRANSACTIONS**

**Project: I-81 Widening MM 221 to MM 225**  
**Project No.: 0081-007-013**

- 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

12/16/22

\_\_\_\_\_  
Date

Partner

\_\_\_\_\_  
Title

Rummel, Klepper & Kahl, LLP


\_\_\_\_\_  
Name of Firm

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

**Project No.: 0081-007-013**

- 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.

	January 11, 2023	Senior Vice President
Signature	Date	Title

Volkert, Inc.

---


Name of Firm

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

**Project No.: 0081-007-013**

- 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.

	12.8.22	President
Signature	Date	Title

On Point Transportation PR  
Name of Firm



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

**Project No.: 0081-007-013**

- 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

Date

Title

*DAVID P. HUGGINS*

*12/8/22*

*Office Manager*

Name of Firm

*ECS Mid-Atlantic LLC 9004 Hunterstand Ct. Charlottesville VA 22911*

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

**Project No.: 0081-007-013**

- 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><i>Leslie R. Reynolds</i></u>	<u>December 13, 2022</u>	<u>Vice President</u>
Signature	Date	Title

H & B Surveying and Mapping, LLC  
Name of Firm

A dark gray background with a complex, white, topographic map pattern of contour lines, creating a textured, wavy effect.

# VDOT Approval of Changes

**From:** Clarke, Joseph <[joseph.clarke@vdot.virginia.gov](mailto:joseph.clarke@vdot.virginia.gov)>  
**Sent:** Monday, December 19, 2022 10:21 AM  
**To:** Donald Bryson <[donald.bryson@branchcivil.com](mailto:donald.bryson@branchcivil.com)>  
**Subject:** Re: I-81 Staunton DB: Request for Approval of Team Changes

Don,

VDOT takes no exception with the proposed changes to the Lead Roadway QA Inspector and Lead Structures QA Inspector positions. In accordance with RFP Part 1 Section 4.2.1, please include a revised org chart and narrative (if necessary) in your Technical Proposal clearly identifying the changes.

Per my email on Friday, we anticipate RFP Addendum No. 2 will be released early this week - my best guess is tomorrow.

Regards,



**Joseph A. Clarke, PE, DBIA**  
*Senior Engineer/ APD Division*  
Virginia Department of Transportation  
804-371-4316  
[joseph.clarke@VDOT.Virginia.gov](mailto:joseph.clarke@VDOT.Virginia.gov)

On Mon, Dec 12, 2022 at 10:35 AM Donald Bryson <[donald.bryson@branchcivil.com](mailto:donald.bryson@branchcivil.com)> wrote:

Joe

Please find attached our request to change team structure on the above captioned project. If you need anything else, please let me know.

**Donald E. Bryson Jr.**  
*Pursuit Manager*  
704-572-1684

**BRANCH CIVIL**  
VIRGINIA | NORTH CAROLINA  
[branchcivil.com](http://branchcivil.com)



**BRANCH  
CIVIL**



3635 Peters Creek Road NW  
Roanoke, VA 24019  
Phone: 540.982.1678  
[www.branchcivil.com](http://www.branchcivil.com) | [www.wrallp.com](http://www.wrallp.com)

TECHNICAL PROPOSAL - VOLUME II

# I-81 WIDENING MM 221 TO MM 225 DESIGN-BUILD

AUGUSTA COUNTY, VIRGINIA

State Project No.: 0081-007-013, B638, B639, B640, B641, B642, C501, D602, D603, P101, R201

Federal Project No.: NHPP-081-2(329)

Contract ID Number: C00116269DB116



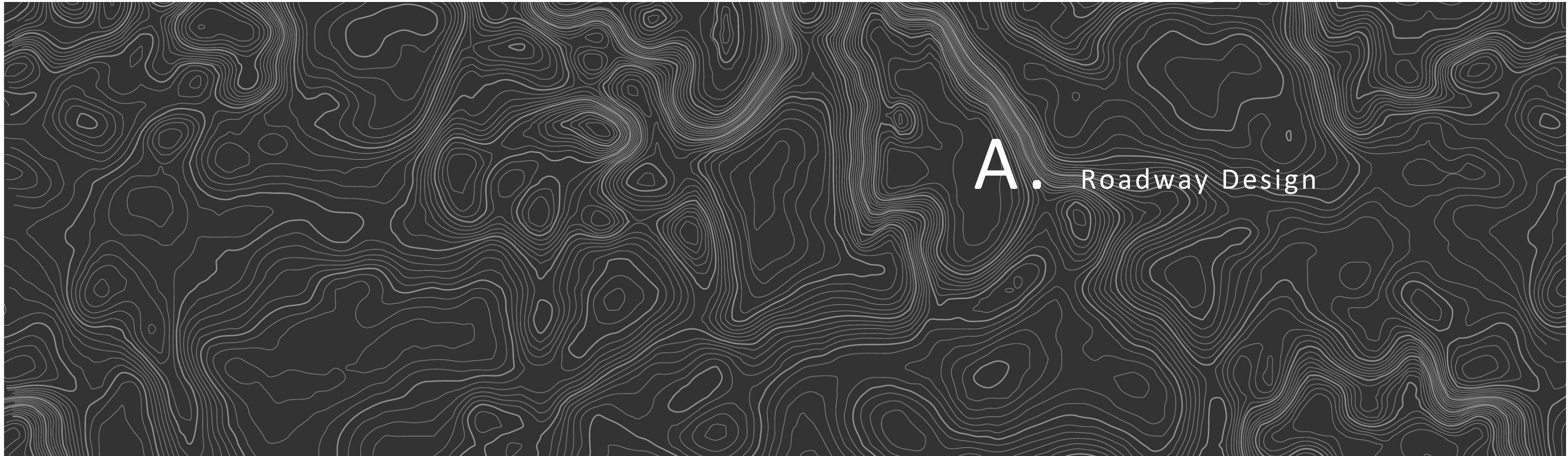
SUBMITTED ELECTRONICALLY  
JANUARY 20, 2023





# TAB 1

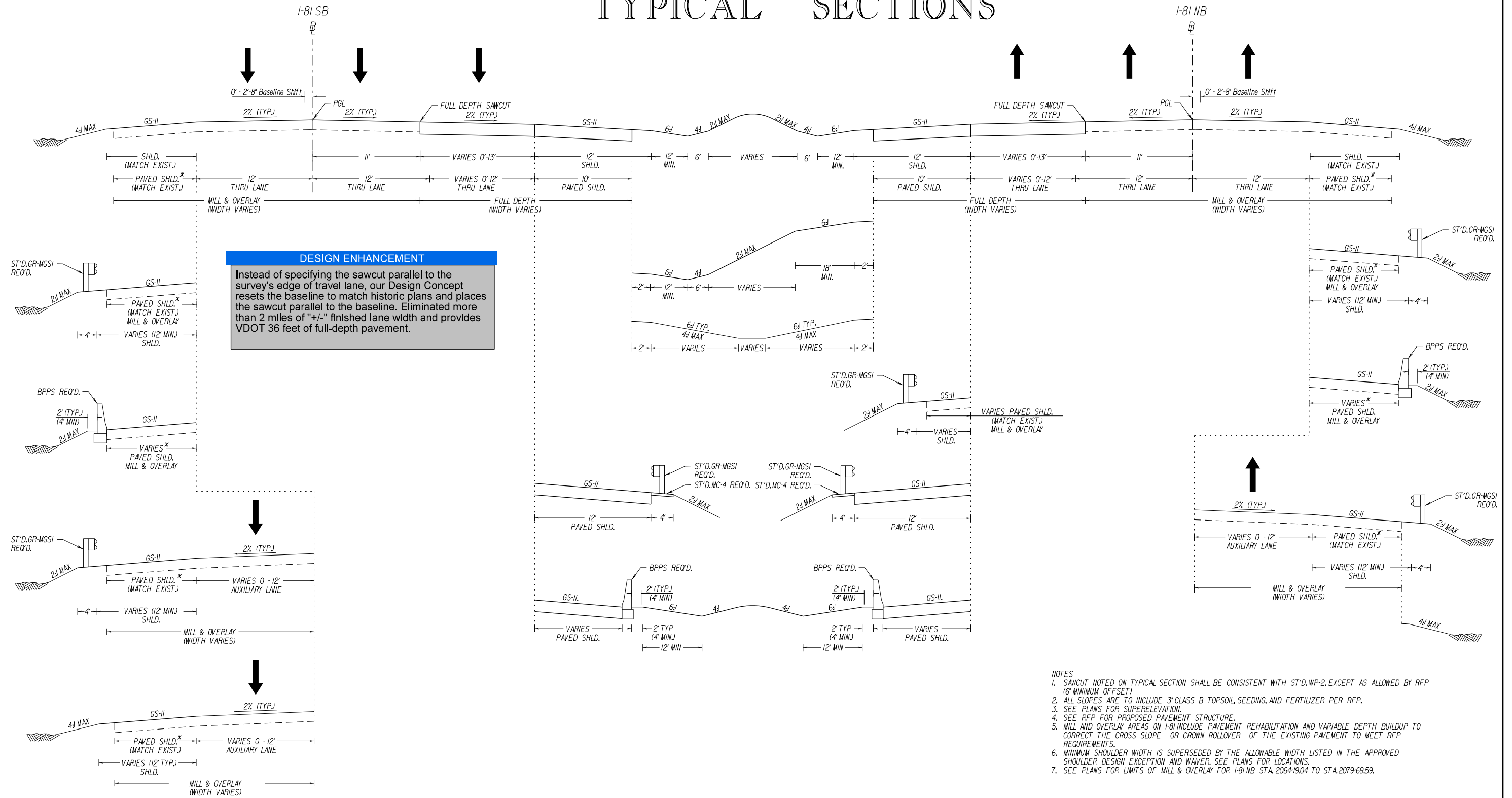
Design Concept



# A. Roadway Design



# TYPICAL SECTIONS



**DESIGN ENHANCEMENT**

Instead of specifying the sawcut parallel to the survey's edge of travel lane, our Design Concept resets the baseline to match historic plans and places the sawcut parallel to the baseline. Eliminated more than 2 miles of "+/-" finished lane width and provides VDOT 36 feet of full-depth pavement.

- NOTES
1. SAWCUT NOTED ON TYPICAL SECTION SHALL BE CONSISTENT WITH ST'D.WP-2, EXCEPT AS ALLOWED BY RFP (6' MINIMUM OFFSET)
  2. ALL SLOPES ARE TO INCLUDE 3" CLASS B TOPSOIL, SEEDING, AND FERTILIZER PER RFP.
  3. SEE PLANS FOR SUPERELEVATION.
  4. SEE RFP FOR PROPOSED PAVEMENT STRUCTURE.
  5. MILL AND OVERLAY AREAS ON I-81 INCLUDE PAVEMENT REHABILITATION AND VARIABLE DEPTH BUILDUP TO CORRECT THE CROSS SLOPE OR CROWN ROLLER OF THE EXISTING PAVEMENT TO MEET RFP REQUIREMENTS.
  6. MINIMUM SHOULDER WIDTH IS SUPERSEDED BY THE ALLOWABLE WIDTH LISTED IN THE APPROVED SHOULDER DESIGN EXCEPTION AND WAIVER. SEE PLANS FOR LOCATIONS.
  7. SEE PLANS FOR LIMITS OF MILL & OVERLAY FOR I-81 NB STA. 2064+9.04 TO STA. 2079+69.59.

TECHNICAL PROPOSAL CONCEPTUAL DESIGN

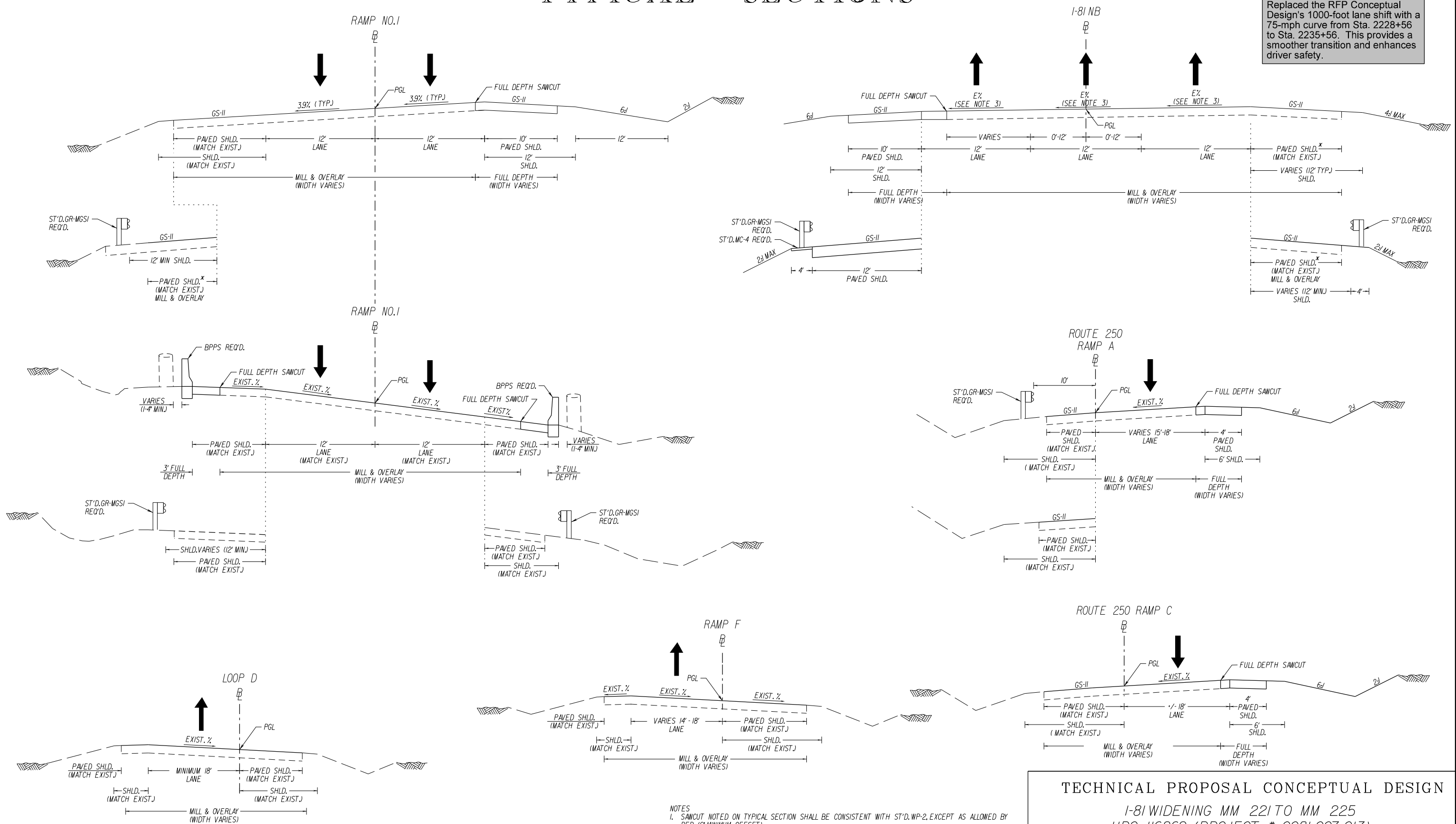
I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 1 OF 20



\*10' MINIMUM PAVED SHOULDER WIDTH PER RFP.

# TYPICAL SECTIONS

**DESIGN ENHANCEMENT**  
 Replaced the RFP Conceptual Design's 1000-foot lane shift with a 75-mph curve from Sta. 2228+56 to Sta. 2235+56. This provides a smoother transition and enhances driver safety.



- NOTES**
- SAWCUT NOTED ON TYPICAL SECTION SHALL BE CONSISTENT WITH ST'D. WP-2, EXCEPT AS ALLOWED BY RFP (6' MINIMUM OFFSET)
  - ALL SLOPES ARE TO INCLUDE 3" CLASS B TOPSOIL, SEEDING, AND FERTILIZER PER RFP.
  - SEE PLANS FOR SUPERELEVATION.
  - SEE RFP FOR PROPOSED PAVEMENT STRUCTURE.
  - MILL AND OVERLAY AREAS ON I-81 INCLUDE PAVEMENT REHABILITATION AND VARIABLE DEPTH BUILDUP TO CORRECT THE CROSS SLOPE OR CROWN ROLLOVER OF THE EXISTING PAVEMENT TO MEET RFP REQUIREMENTS.
  - MINIMUM SHOULDER WIDTH IS SUPERSEDED BY THE ALLOWABLE WIDTH LISTED IN THE APPROVED SHOULDER DESIGN EXCEPTION AND WAIVER. SEE PLANS FOR LOCATIONS.

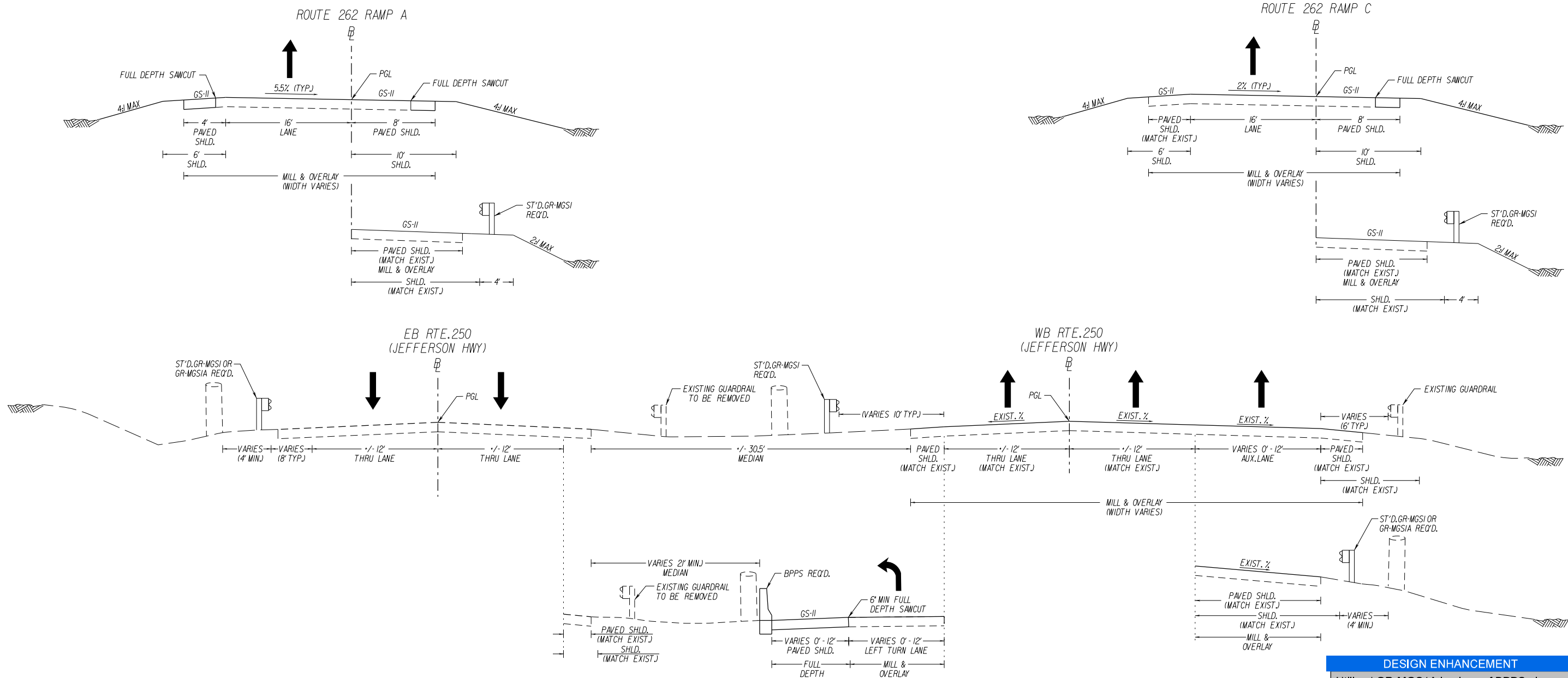
**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**

I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 2 OF 20



\*10' MINIMUM PAVED SHOULDER WIDTH PER RFP.

# TYPICAL SECTIONS



**DESIGN ENHANCEMENT**  
 Utilized GR-MGS1A in place of BPPS along the outside shoulder of WB Route 250 while still providing a 12' shoulder reduces project cost and traffic impacts from constructing BPPS.

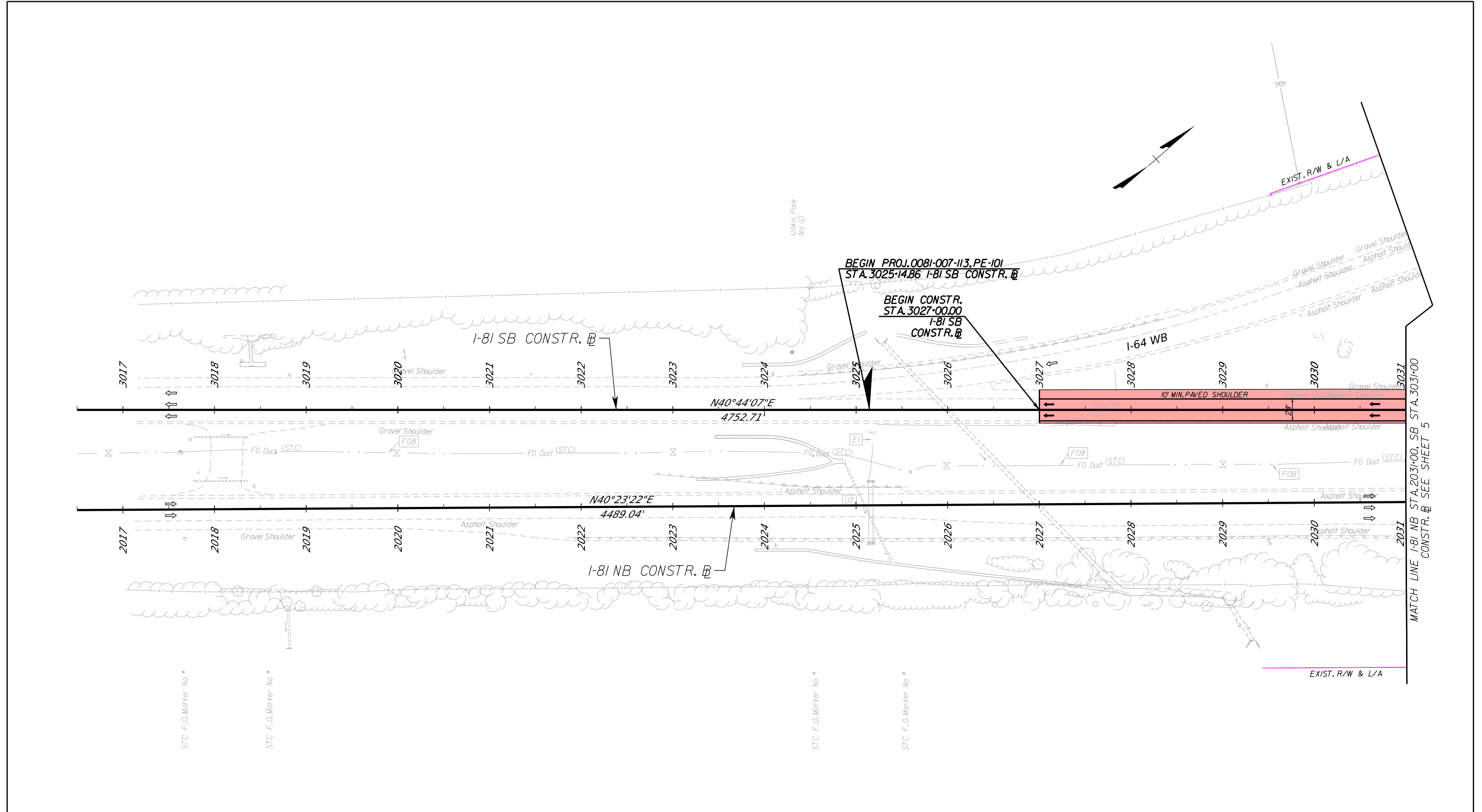
- NOTES
1. SAWCUT NOTED ON TYPICAL SECTION SHALL BE CONSISTENT WITH ST'D.WP-2, EXCEPT AS ALLOWED BY RFP (6' MINIMUM OFFSET)
  2. ALL SLOPES ARE TO INCLUDE 3" CLASS B TOPSOIL, SEEDING, AND FERTILIZER PER RFP.
  3. SEE PLANS FOR SUPERELEVATION.
  4. SEE RFP FOR PROPOSED PAVEMENT STRUCTURE.
  5. MILL AND OVERLAY AREAS ON I-81 INCLUDE PAVEMENT REHABILITATION AND VARIABLE DEPTH BUILDUP TO CORRECT THE CROSS SLOPE OR CROWN ROLLOVER OF THE EXISTING PAVEMENT TO MEET RFP REQUIREMENTS.
  6. MINIMUM SHOULDER WIDTH IS SUPERSEDED BY THE ALLOWABLE WIDTH LISTED IN THE APPROVED SHOULDER DESIGN EXCEPTION AND WAIVER, SEE PLANS FOR LOCATIONS.
  7. SEE PLANS FOR LIMITS OF MILL & OVERLAY FOR I-81 NB STA. 2064+9.04 TO STA. 2079+69.59.

\*10' MINIMUM PAVED SHOULDER WIDTH PER RFP.

TECHNICAL PROPOSAL CONCEPTUAL DESIGN

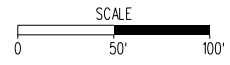
I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 3 OF 20





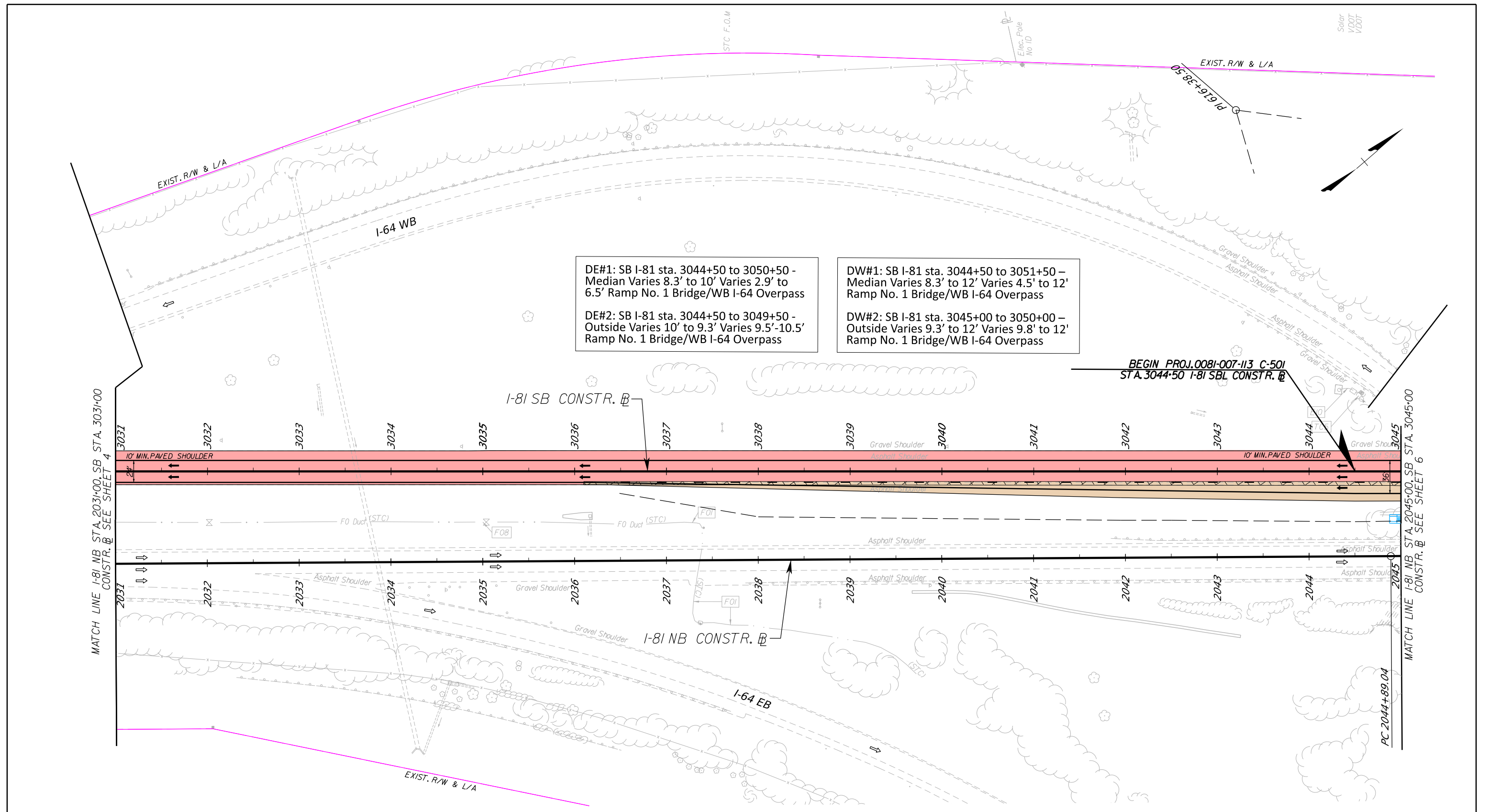
**LEGEND:**

EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	PROPOSED BRIDGE	PROPOSED GUARDRAIL REQ'D.	SFM
EXISTING VPRA R/W	MILL/OVERLAY AND BUILDUP	PROPOSED CONCRETE BARRIER REQ'D.	NATURAL GAS
PROPOSED PERMANENT AERIAL EASEMENT	FULL DEPTH PAVEMENT	PROPOSED PIER PROTECTION BARRIER REQ'D.	EXISTING WATER
PROPOSED PERMANENT BRIDGE EASEMENT	PAVEMENT DEMOLITION	NOT USED	EXISTING ELECTRIC
PROPOSED TEMPORARY EASEMENT	PROPOSED STORMWATER MANAGEMENT FACILITY	PROPOSED CURBING REQ'D.	EXISTING FIBER OPTIC
PROPOSED PERMANENT EASEMENT	PROPOSED STREAM STABILIZATION CONCEPT	PROPOSED GRASS DITCH	EXISTING CABLE TV
RFP PROPOSED TEMPORARY AERIAL EASEMENT	DENOTES CONSTRUCTION LIMITS IN CUT	PROPOSED LINED DITCH	EXISTING TELEPHONE
RFP PROPOSED TEMPORARY EASEMENT	DENOTES CONSTRUCTION LIMITS IN FILL	PROPOSED CONCRETE LINED DITCH	EXISTING TRAFFIC CONTROL
RFP PROPOSED PERMANENT EASEMENT		PROPOSED STORM DRAIN PIPE	EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 4 OF 20





DE#1: SB I-81 sta. 3044+50 to 3050+50 - Median Varies 8.3' to 10' Varies 2.9' to 6.5' Ramp No. 1 Bridge/WB I-64 Overpass

DE#2: SB I-81 sta. 3044+50 to 3049+50 - Outside Varies 10' to 9.3' Varies 9.5'-10.5' Ramp No. 1 Bridge/WB I-64 Overpass

DW#1: SB I-81 sta. 3044+50 to 3051+50 - Median Varies 8.3' to 12' Varies 4.5' to 12' Ramp No. 1 Bridge/WB I-64 Overpass

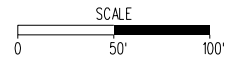
DW#2: SB I-81 sta. 3045+00 to 3050+00 - Outside Varies 9.3' to 12' Varies 9.8' to 12' Ramp No. 1 Bridge/WB I-64 Overpass

BEGIN PROJ.0081-007-113 C-501 STA. 3044+50 I-81 SBL CONSTR. @

MATCH LINE I-81 NB STA. 2031+00, SB STA. 3031+00 CONSTR. @ SEE SHEET 4

MATCH LINE I-81 NB STA. 2045+00, SB STA. 3045+00 CONSTR. @ SEE SHEET 6

LEGEND:	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
	EXISTING VPRA R/W
	PROPOSED PERMANENT AERIAL EASEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT
	PROPOSED TEMPORARY EASEMENT
	PROPOSED PERMANENT EASEMENT
	RFP PROPOSED TEMPORARY AERIAL EASEMENT
	RFP PROPOSED TEMPORARY EASEMENT
	RFP PROPOSED PERMANENT EASEMENT
	PROPOSED BRIDGE
	MILL, OVERLAY AND BUILDUP
	FULL DEPTH PAVEMENT
	PAVEMENT DEMOLITION
	PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED STREAM STABILIZATION CONCEPT
	DENOTES CONSTRUCTION LIMITS IN CUT
	DENOTES CONSTRUCTION LIMITS IN FILL
	PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.
	PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED
	PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH
	PROPOSED LINED DITCH
	PROPOSED CONCRETE LINED DITCH
	PROPOSED STORM DRAIN PIPE
	SFM SFM
	G NATURAL GAS
	2W EXISTING WATER
	E EXISTING ELECTRIC
	FO EXISTING FIBER OPTIC
	CV EXISTING CABLE TV
	T/Ts EXISTING TELEPHONE
	TC EXISTING TRAFFIC CONTROL
	UX EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 5 OF 20



EXIST. R/W & L/A

**I-81 SB CURVE DATA**

PI = 3060+09.49  
DELTA = 12°27'58.34" (RT)  
D = 00°29'53"  
T = 1,256.79'  
L = 2,503.65'  
R = 11,507.00'  
PC = 3047+52.71  
PT = 3072+56.36  
e = 2.0%  
V = 70 MPH

**RAMP NO. 1 CURVE DATA**

PI = 616+38.50	PI = 621+09.18	PI = 627+91.17
DELTA = 113°30'20.33" (RT)	DELTA = 18°53'43.15" (RT)	DELTA = 17°52'22.30" (LT)
D = 08°05'33"	D = 06°26'16"	D = 02°59'59"
T = 1,080.00'	T = 148.10'	T = 300.34'
L = 1,402.58'	L = 293.51'	L = 595.81'
R = 708.00'	R = 890.00'	R = 1,910.00'
PC = 605+58.50	PC = 619+61.08	PC = 624+90.83
PT = 619+61.08	PT = 622+54.59	PT = 630+86.64
e = EXIST.	e = EXIST.	e = 3.9%
V = 40 MPH	V = 40 MPH	V = 40 MPH

RAMP NO. 1 CONSTR. B

RAMP NO. 1

**DESIGN ENHANCEMENT**

Modified stormwater approach which reduced the linear BMP facilities by 70% and reducing long term maintenance and inspection costs.

I-81 SB CONSTR. B

I-81 NB CONSTR. B

DE#1: SB I-81 sta. 3044+50 to 3050+50 -  
Median Varies 8.3' to 10' Varies 2.9' to 6.5'  
Ramp No. 1 Bridge/WB I-64 Overpass

DE#2: SB I-81 sta. 3044+50 to 3049+50 -  
Outside Varies 10' to 9.3' Varies 9.5'-10.5'  
Ramp No. 1 Bridge/WB I-64 Overpass

DW#1: SB I-81 sta. 3044+50 to 3051+50 -  
Median Varies 8.3' to 12' Varies 4.5' to 12'  
Ramp No. 1 Bridge/WB I-64 Overpass

DW#2: SB I-81 sta. 3045+00 to 3050+00 -  
Outside Varies 9.3' to 12' Varies 9.8' to 12'  
Ramp No. 1 Bridge/WB I-64 Overpass

**I-81 NB CURVE DATA**

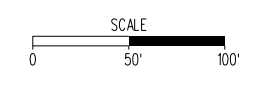
PI = 2059+08.17  
DELTA = 14°09'18.22" (RT)  
D = 00°30'05"  
T = 1,419.13'  
L = 2,823.81'  
R = 11,430.00'  
PC = 2044+89.04  
PT = 2073+12.85  
e = 2.0%  
V = 70 MPH

RAMP NO. 2

**LEGEND:**

	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED BRIDGE		PROPOSED GUARDRAIL REQ'D.		SFM	SFM
	EXISTING VPRA R/W		MILL/OVERLAY AND BUILDUP		PROPOSED CONCRETE BARRIER REQ'D.		G	NATURAL GAS
	PROPOSED PERMANENT AERIAL EASEMENT		FULL DEPTH PAVEMENT		PROPOSED PIER PROTECTION BARRIER REQ'D.		24W	EXISTING WATER
	PROPOSED PERMANENT BRIDGE EASEMENT		PAVEMENT DEMOLITION		NOT USED		E	EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		PROPOSED STORMWATER MANAGEMENT FACILITY		PROPOSED CURBING REQ'D.		FO	EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT		PROPOSED STREAM STABILIZATION CONCEPT		PROPOSED GRASS DITCH		CHV	EXISTING CABLE TV
	RFP PROPOSED PERMANENT AERIAL EASEMENT				PROPOSED LINED DITCH		T/TS	EXISTING TELEPHONE
	RFP PROPOSED TEMPORARY EASEMENT				PROPOSED CONCRETE LINED DITCH		TC	EXISTING TRAFFIC CONTROL
	RFP PROPOSED PERMANENT EASEMENT				PROPOSED STORM DRAIN PIPE		UNK	EXISTING UNKNOWN UTILITY

DENOTES CONSTRUCTION LIMITS IN CUT  
 DENOTES CONSTRUCTION LIMITS IN FILL



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I-81 WIDENING MM 221 TO MM 225  
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**RAMP NO. 1 CURVE DATA**

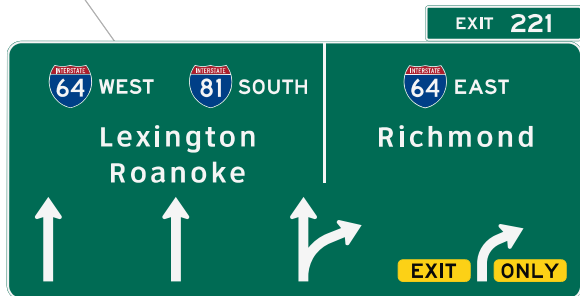
PI = 627+91.17  
 DELTA = 17°52'22.30" (LT)  
 D = 02°59'59"  
 T = 300.34'  
 L = 595.81'  
 R = 1,910.00'  
 PC = 624+90.83  
 PT = 630+86.64  
 e = 3.9%  
 V = 40 MPH

**I-81 SB CURVE DATA**

PI = 3060+09.49  
 DELTA = 12°27'58.34" (RT)  
 D = 00°29'53"  
 T = 1,256.79'  
 L = 2,503.65'  
 R = 11,507.00'  
 PC = 3047+52.71  
 PT = 3072+56.36  
 e = 2.0%  
 V = 70 MPH

**I-81 NB CURVE DATA**

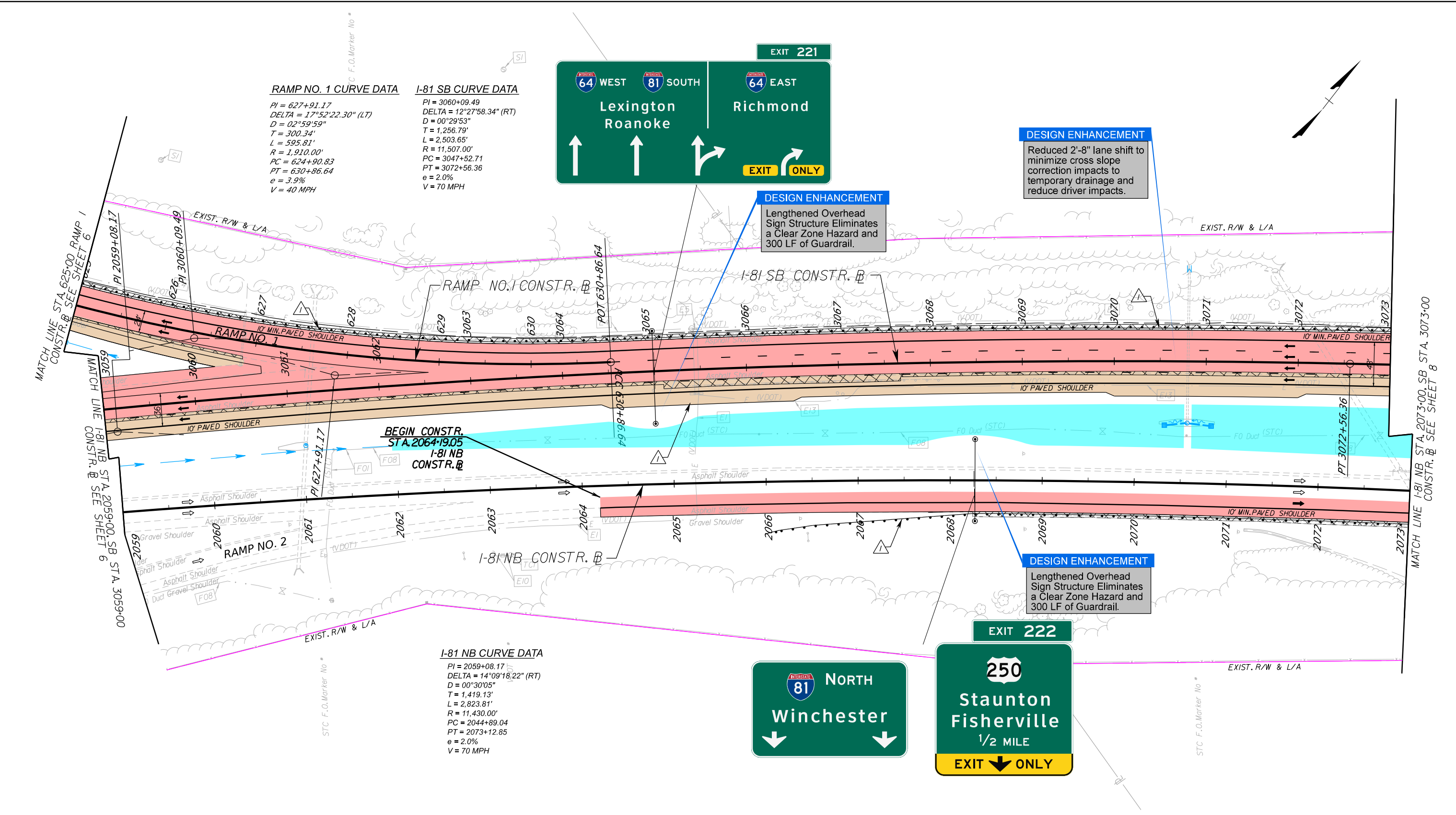
PI = 2059+08.17  
 DELTA = 14°09'18.22" (RT)  
 D = 00°30'05"  
 T = 1,419.13'  
 L = 2,823.81'  
 R = 11,430.00'  
 PC = 2044+89.04  
 PT = 2073+12.85  
 e = 2.0%  
 V = 70 MPH



**DESIGN ENHANCEMENT**  
 Lengthened Overhead Sign Structure Eliminates a Clear Zone Hazard and 300 LF of Guardrail.

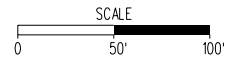
**DESIGN ENHANCEMENT**  
 Reduced 2'-8" lane shift to minimize cross slope correction impacts to temporary drainage and reduce driver impacts.

**DESIGN ENHANCEMENT**  
 Lengthened Overhead Sign Structure Eliminates a Clear Zone Hazard and 300 LF of Guardrail.



**LEGEND:**

EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	PROPOSED BRIDGE	PROPOSED GUARDRAIL REQ'D.	SFW
EXISTING VPRA R/W	MILL/OVERLAY AND BUILDUP	PROPOSED CONCRETE BARRIER REQ'D.	NATURAL GAS
PROPOSED PERMANENT AERIAL EASEMENT	FULL DEPTH PAVEMENT	PROPOSED PIER PROTECTION BARRIER REQ'D.	EXISTING WATER
PROPOSED PERMANENT BRIDGE EASEMENT	PAVEMENT DEMOLITION	NOT USED	EXISTING ELECTRIC
PROPOSED TEMPORARY EASEMENT	PROPOSED STORMWATER MANAGEMENT FACILITY	PROPOSED CURBING REQ'D.	EXISTING FIBER OPTIC
PROPOSED PERMANENT EASEMENT	PROPOSED STREAM STABILIZATION CONCEPT	PROPOSED GRASS DITCH	EXISTING CABLE TV
RFP PROPOSED TEMPORARY AERIAL EASEMENT	DENOTES CONSTRUCTION LIMITS IN CUT	PROPOSED LINED DITCH	EXISTING TELEPHONE
RFP PROPOSED TEMPORARY EASEMENT	DENOTES CONSTRUCTION LIMITS IN FILL	PROPOSED CONCRETE LINED DITCH	EXISTING TRAFFIC CONTROL
RFP PROPOSED PERMANENT EASEMENT		PROPOSED STORM DRAIN PIPE	EXISTING UNKNOWN UTILITY



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EXIT 221

64 WEST 81 SOUTH 64 EAST

Lexington Roanoke

Richmond

1/4 MILE

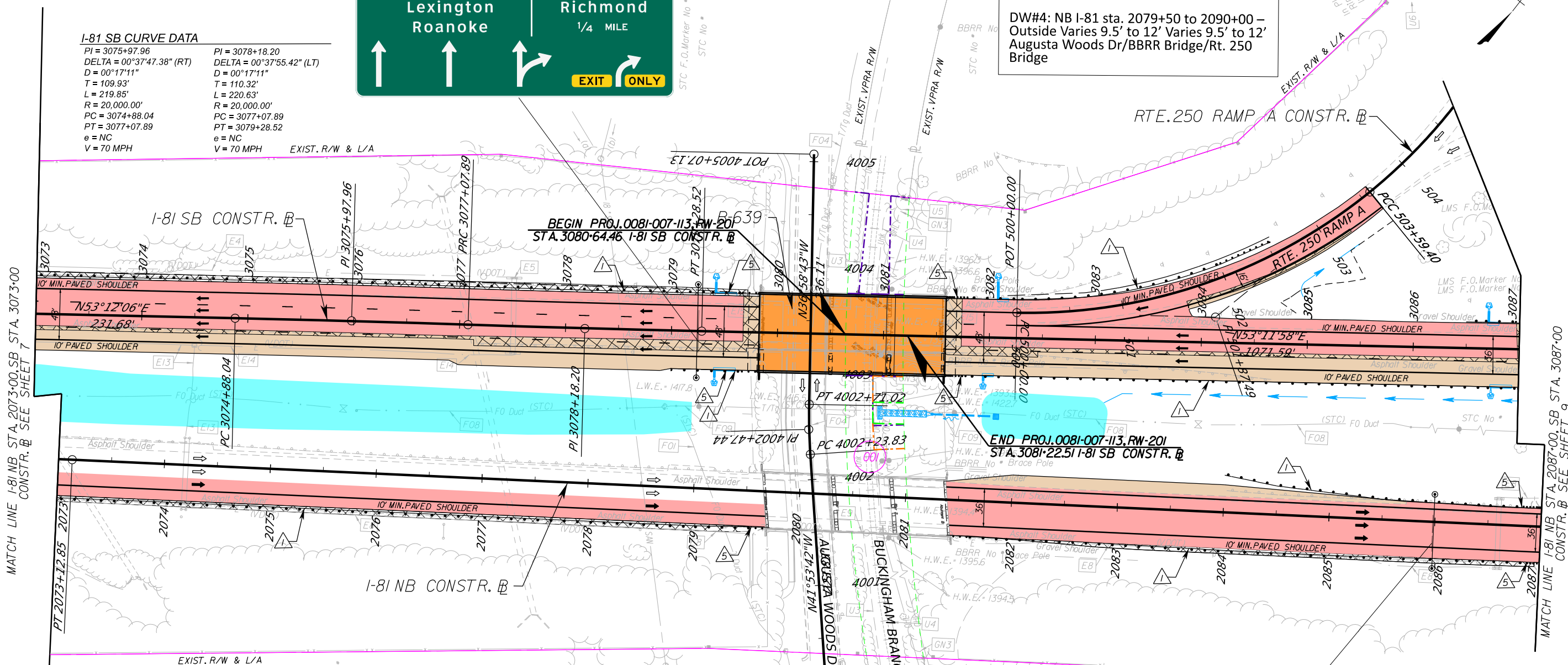
EXIT ONLY

**I-81 SB CURVE DATA**

PI = 3075+97.96	PI = 3078+18.20
DELTA = 00°37'47.38" (RT)	DELTA = 00°37'55.42" (LT)
D = 00°17'11"	D = 00°17'11"
T = 109.93'	T = 110.32'
L = 219.85'	L = 220.63'
R = 20,000.00'	R = 20,000.00'
PC = 3074+88.04	PC = 3077+07.89
PT = 3077+07.89	PT = 3079+28.52
e = NC	e = NC
V = 70 MPH	V = 70 MPH

DW#3: NB I-81 sta. 2079+50 to 2090+00 - Median Varies 5.8' to 12' Varies 6.6' to 12' Augusta Woods Dr/BBRR Bridge/Rt. 250 Bridge

DW#4: NB I-81 sta. 2079+50 to 2090+00 - Outside Varies 9.5' to 12' Varies 9.5' to 12' Augusta Woods Dr/BBRR Bridge/Rt. 250 Bridge



**I-81 NB CURVE DATA**

PI = 2059+08.17
DELTA = 14°09'18.22" (RT)
D = 00°30'05"
T = 1,419.13'
L = 2,823.81'
R = 11,430.00'
PC = 2044+89.04
PT = 2073+12.85
e = 2.0%
V = 70 MPH

**AUGUSTA WOODS DR. CURVE DATA**

PI = 4002+47.44
DELTA = 04°54'59.12" (RT)
D = 10°25'03"
T = 23.61'
L = 47.19'
R = 550.00'
PC = 4002+23.83
PT = 4002+71.02
e = EXIST.
V = 25 MPH

**RTE. 250 RAMP A CURVE DATA**

PI = 501+87.49	PI = 506+08.97
DELTA = 40°17'52.68" (LT)	DELTA = 53°03'05.05" (LT)
D = 11°12'45"	D = 11°27'33"
T = 187.49'	T = 249.57'
L = 359.40'	L = 462.96'
R = 511.00'	R = 500.00'
PC = 500+00.00	PC = 503+59.40
PT = 503+59.40	PT = 508+22.36
e = EXIST.	e = N/A
V = 35 MPH	V = 35 MPH

EXIT 222

81 NORTH

Winchester

250

Staunton Fishersville

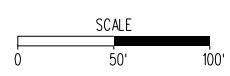
EXIT ONLY

**LEGEND:**

	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED BRIDGE		PROPOSED GUARDRAIL REQ'D.		NATURAL GAS
	EXISTING VPRA R/W		MILL/OVERLAY AND BUILDUP		PROPOSED CONCRETE BARRIER REQ'D.		EXISTING WATER
	PROPOSED PERMANENT AERIAL EASEMENT		FULL DEPTH PAVEMENT		PROPOSED PIER PROTECTION BARRIER REQ'D.		EXISTING ELECTRIC
	PROPOSED PERMANENT BRIDGE EASEMENT		PAVEMENT DEMOLITION		NOT USED		EXISTING FIBER OPTIC
	PROPOSED TEMPORARY EASEMENT		PROPOSED STORMWATER MANAGEMENT FACILITY		PROPOSED CURBING REQ'D.		EXISTING CABLE TV
	PROPOSED PERMANENT EASEMENT		PROPOSED STREAM STABILIZATION CONCEPT		PROPOSED GRASS DITCH		EXISTING TELEPHONE
	RFP PROPOSED TEMPORARY AERIAL EASEMENT				PROPOSED LINED DITCH		EXISTING TRAFFIC CONTROL
	RFP PROPOSED PERMANENT EASEMENT				PROPOSED STORM DRAIN PIPE		EXISTING UNKNOWN UTILITY

DENOTES CONSTRUCTION LIMITS IN CUT

DENOTES CONSTRUCTION LIMITS IN FILL



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I-81 WIDENING MM 221 TO MM 225

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DW#3: NB I-81 sta. 2079+50 to 2090+00 - Median Varies 5.8' to 12' Varies 6.6' to 12' Augusta Woods Dr/BBRR Bridge/Rt. 250 Bridge

DW#4: NB I-81 sta. 2079+50 to 2090+00 - Outside Varies 9.5' to 12' Varies 9.5' to 12' Augusta Woods Dr/BBRR Bridge/Rt. 250 Bridge

**RTE. 250 RAMP C CURVE DATA**

PI = 711+92.43  
 DELTA = 11°38'20.02" (LT)  
 D = 02°59'59"  
 T = 194.67'  
 L = 387.99'  
 R = 1,910.00'  
 PC = 709+97.76  
 PT = 713+85.75  
 e = 3.2%  
 V = 35 MPH

**I-81 SB CURVE DATA**

PI = 3091+08.69 DELTA = 00°37'19.66" (LT) D = 00°17'11" T = 108.58' L = 217.16' R = 20,000.00' PC = 3090+00.11 PT = 3092+17.27 e = NC V = 70 MPH	PI = 3093+26.24 DELTA = 00°37'27.70" (RT) D = 00°17'11" T = 108.97' L = 217.94' R = 20,000.00' PC = 3092+17.27 PT = 3094+35.21 e = NC V = 70 MPH
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**DESIGN ENHANCEMENT**

Utilized GR-MGS1A in place of BPPS along the outside shoulder of WB Route 250 while still providing a 12' shoulder reduces project cost and traffic impacts from constructing BPPS.

DW#9: WB Rt. 250 sta. 6020+00 to 6021+00 - Median Varies 4.5' to 10' Under I-81 SB Bridge

**DESIGN ENHANCEMENT**

Reduced 2'-8" lane shift to minimize cross slope correction impacts to temporary drainage and reduce driver impacts.

**DESIGN ENHANCEMENT**

Lengthened Overhead Sign Structure Eliminates a Clear Zone Hazard and 300 LF of Guardrail.

**DESIGN ENHANCEMENT**

Balanced median earthwork eliminates hauling surplus material off-site which reduces truck traffic by approximately 13,600 truck trips and limits impacts to the traveling public.

**RTE. 250 LOOP D CURVE DATA**

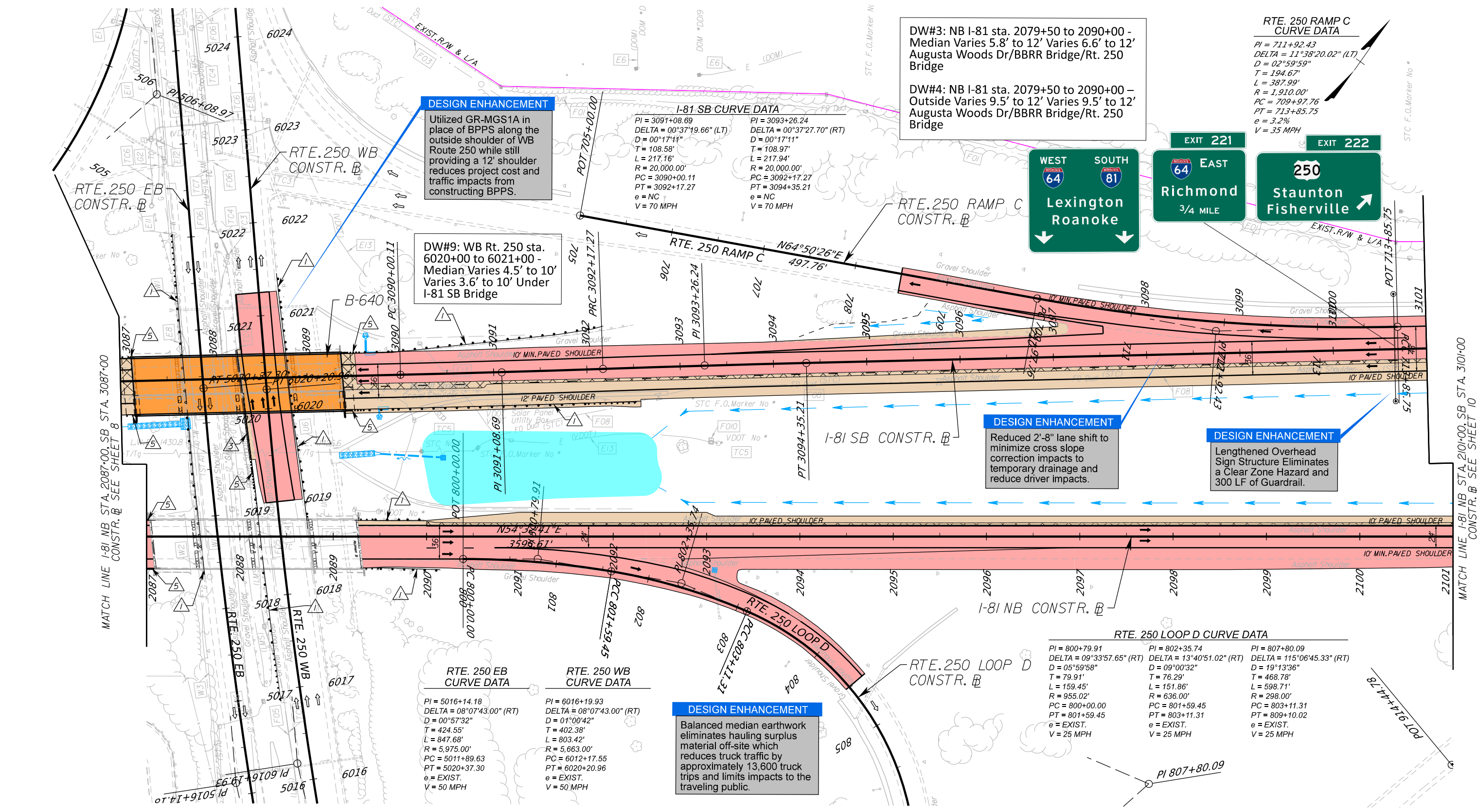
PI = 800+79.91 DELTA = 09°33'57.65" (RT) D = 05°59'58" T = 79.91' L = 159.45' R = 955.02' PC = 800+00.00 PT = 801+59.45 e = EXIST. V = 25 MPH	PI = 802+35.74 DELTA = 13°40'51.02" (RT) D = 09°00'32" T = 76.29' L = 151.86' R = 636.00' PC = 801+59.45 PT = 803+11.31 e = EXIST. V = 25 MPH	PI = 807+80.09 DELTA = 115°06'45.33" (RT) D = 19°13'36" T = 468.78' L = 598.71' R = 298.00' PC = 803+11.31 PT = 809+10.02 e = EXIST. V = 25 MPH
--	--	--

**RTE. 250 EB CURVE DATA**

PI = 5016+14.18  
 DELTA = 08°07'43.00" (RT)  
 D = 00°57'32"  
 T = 424.55'  
 L = 847.68'  
 R = 5,975.00'  
 PC = 5011+89.63  
 PT = 5020+37.30  
 e = EXIST.  
 V = 50 MPH

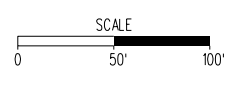
**RTE. 250 WB CURVE DATA**

PI = 6016+19.93  
 DELTA = 08°07'43.00" (RT)  
 D = 01°00'42"  
 T = 402.38'  
 L = 803.42'  
 R = 5,663.00'  
 PC = 6012+17.55  
 PT = 6020+20.96  
 e = EXIST.  
 V = 50 MPH



**LEGEND:**

EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	PROPOSED BRIDGE	PROPOSED GUARDRAIL REQ'D.	SFM - SFM
EXISTING VPRA R/W	MILL, OVERLAY AND BUILDUP	PROPOSED CONCRETE BARRIER REQ'D.	G - NATURAL GAS
PROPOSED PERMANENT AERIAL EASEMENT	FULL DEPTH PAVEMENT	PROPOSED PIER PROTECTION BARRIER REQ'D.	24" W - EXISTING WATER
PROPOSED PERMANENT BRIDGE EASEMENT	PAVEMENT DEMOLITION	NOT USED	E - EXISTING ELECTRIC
PROPOSED TEMPORARY EASEMENT	PROPOSED STORMWATER MANAGEMENT FACILITY	PROPOSED CURBING REQ'D.	FO - EXISTING FIBER OPTIC
PROPOSED PERMANENT EASEMENT	PROPOSED STREAM STABILIZATION CONCEPT	PROPOSED GRASS DITCH	CTV - EXISTING CABLE TV
RFP PROPOSED TEMPORARY AERIAL EASEMENT		PROPOSED LINED DITCH	T/S - EXISTING TELEPHONE
RFP PROPOSED PERMANENT EASEMENT		PROPOSED CONCRETE LINED DITCH	TC - EXISTING TRAFFIC CONTROL
RFP PROPOSED PERMANENT EASEMENT		PROPOSED STORM DRAIN PIPE	U - EXISTING UNKNOWN UTILITY
DENOTES CONSTRUCTION LIMITS IN CUT			
DENOTES CONSTRUCTION LIMITS IN FILL			

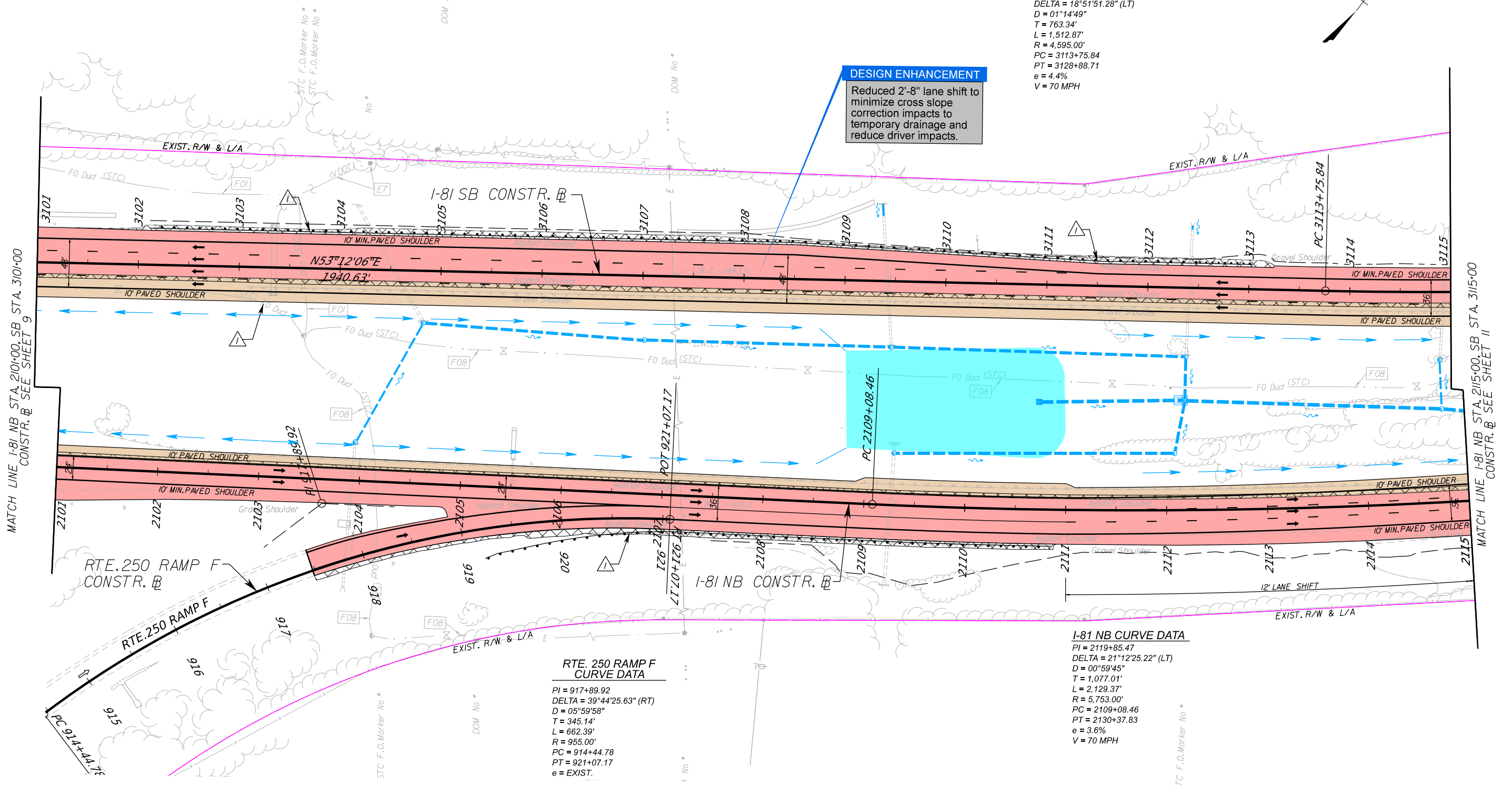


TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
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**I-81 SB CURVE DATA**  
 PI = 3121+39.18  
 DELTA = 18°51'51.28" (LT)  
 D = 01°14'49"  
 T = 763.34'  
 L = 1,512.87'  
 R = 4,595.00'  
 PC = 3113+75.84  
 PT = 3128+88.71  
 e = 4.4%  
 V = 70 MPH

**DESIGN ENHANCEMENT**  
 Reduced 2'-8" lane shift to minimize cross slope correction impacts to temporary drainage and reduce driver impacts.

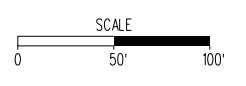


**RTE. 250 RAMP F CURVE DATA**  
 PI = 917+89.92  
 DELTA = 39°44'25.63" (RT)  
 D = 05°59'58"  
 T = 345.14'  
 L = 662.39'  
 R = 955.00'  
 PC = 914+44.78  
 PT = 921+07.17  
 e = EXIST.

**I-81 NB CURVE DATA**  
 PI = 2119+85.47  
 DELTA = 21°12'25.22" (LT)  
 D = 00°59'45"  
 T = 1,077.01'  
 L = 2,129.37'  
 R = 5,753.00'  
 PC = 2109+08.46  
 PT = 2130+37.83  
 e = 3.6%  
 V = 70 MPH

**LEGEND:**

EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	PROPOSED BRIDGE	PROPOSED GUARDRAIL REQ'D.	SFM
EXISTING VPRA R/W	MILL/OVERLAY AND BUILDUP	PROPOSED CONCRETE BARRIER REQ'D.	NATURAL GAS
PROPOSED PERMANENT AERIAL EASEMENT	FULL DEPTH PAVEMENT	PROPOSED PIER PROTECTION BARRIER REQ'D.	EXISTING WATER
PROPOSED PERMANENT BRIDGE EASEMENT	PAVEMENT DEMOLITION	NOT USED	EXISTING ELECTRIC
PROPOSED TEMPORARY EASEMENT	PROPOSED STORMWATER MANAGEMENT FACILITY	PROPOSED CURBING REQ'D.	EXISTING FIBER OPTIC
PROPOSED PERMANENT EASEMENT	PROPOSED STREAM STABILIZATION CONCEPT	PROPOSED GRASS DITCH	EXISTING CABLE TV
RFP PROPOSED TEMPORARY AERIAL EASEMENT	DENOTES CONSTRUCTION LIMITS IN CUT	PROPOSED LINED DITCH	EXISTING TELEPHONE
RFP PROPOSED TEMPORARY EASEMENT	DENOTES CONSTRUCTION LIMITS IN FILL	PROPOSED CONCRETE LINED DITCH	EXISTING TRAFFIC CONTROL
RFP PROPOSED PERMANENT EASEMENT		PROPOSED STORM DRAIN PIPE	EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
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**I-81 NB CURVE DATA**

PI = 3121+39.18  
 DELTA = 18°51'51.28" (LT)  
 D = 01°14'49"  
 T = 763.34'  
 L = 1,512.87'  
 R = 4,595.00'  
 PC = 3113+75.84  
 PT = 3128+88.71  
 e = 4.4%  
 V = 70 MPH



**DESIGN ENHANCEMENT**

Reduced 2'-8" lane shift to minimize cross slope correction impacts to temporary drainage and reduce driver impacts.

**DESIGN ENHANCEMENT**

Lengthened Overhead Sign Structure Eliminates a Clear Zone Hazard and 300 LF of Guardrail.

**DESIGN ENHANCEMENT**

Maintained the existing auxiliary lane as additional full-depth paved shoulder which reduces cost to future I-81 widening projects and safety of the traveling public.

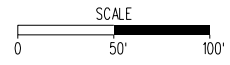
**I-81 NB CURVE DATA**

PI = 2119+85.47  
 DELTA = 21°12'25.22" (LT)  
 D = 00°59'45"  
 T = 1,077.01'  
 L = 2,129.37'  
 R = 5,753.00'  
 PC = 2109+08.46  
 PT = 2130+37.83  
 e = 3.6%  
 V = 70 MPH

MATCH LINE I-81 NB STA. 2115+00, SB STA. 3115+00  
CONSTR. B SEE SHEET 10

MATCH LINE I-81 NB STA. 2129+00, SB STA. 3129+00  
CONSTR. B SEE SHEET 12

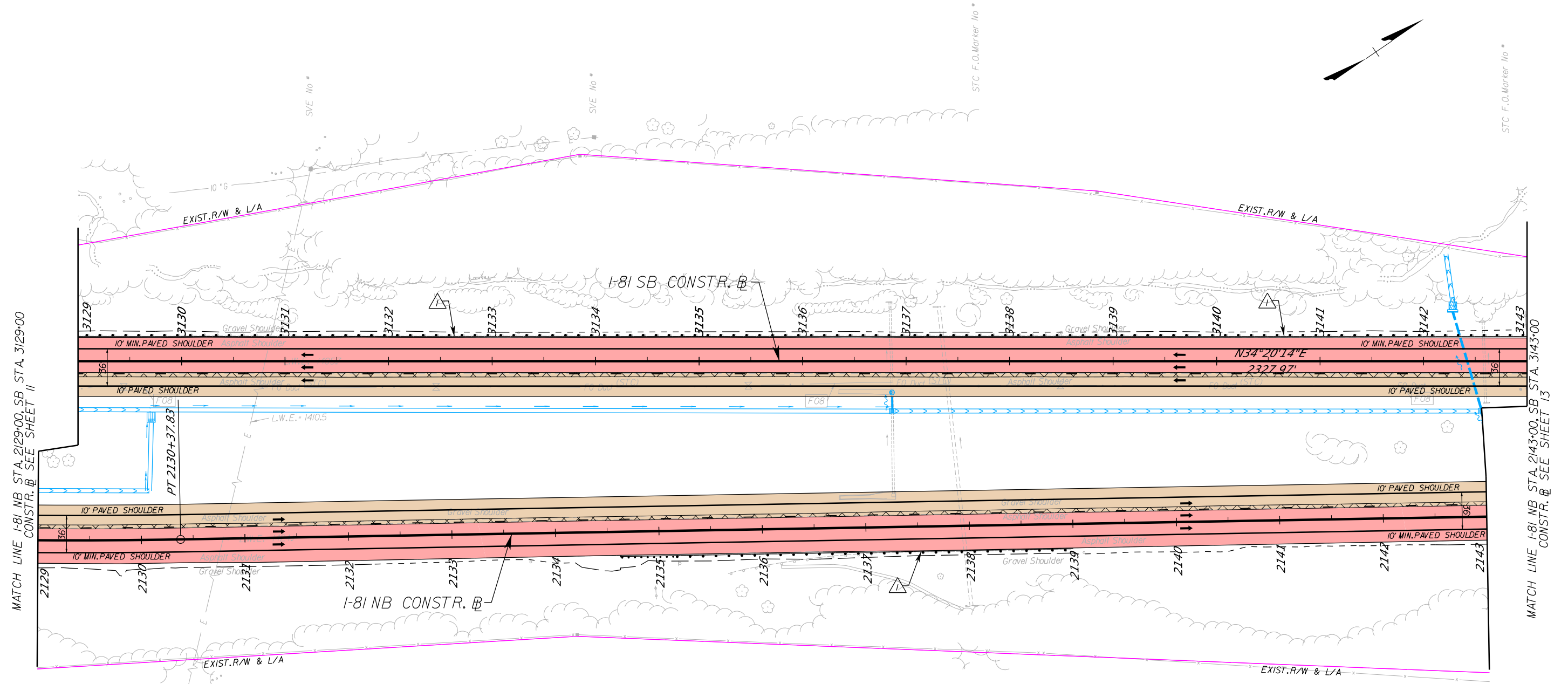
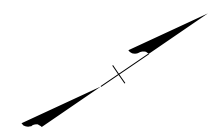
LEGEND:		PROPOSED GUARDRAIL REQ'D.		SFM	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED GUARDRAIL REQ'D.		SFM
	EXISTING VPRA R/W		PROPOSED CONCRETE BARRIER REQ'D.		NATURAL GAS
	PROPOSED PERMANENT AERIAL EASEMENT		PROPOSED PIER PROTECTION BARRIER REQ'D.		EXISTING WATER
	PROPOSED PERMANENT BRIDGE EASEMENT		NOT USED		EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		PROPOSED CURBING REQ'D.		EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT				EXISTING CABLE TV
	RFP PROPOSED TEMPORARY AERIAL EASEMENT				EXISTING TELEPHONE
	RFP PROPOSED PERMANENT EASEMENT				EXISTING TRAFFIC CONTROL
	RFP PROPOSED PERMANENT EASEMENT				EXISTING UNKNOWN UTILITY
	PROPOSED BRIDGE		PROPOSED GRASS DITCH		
	MILL, OVERLAY AND BUILDUP		PROPOSED LINED DITCH		
	FULL DEPTH PAVEMENT		PROPOSED CONCRETE LINED DITCH		
	PAVEMENT DEMOLITION		PROPOSED STORM DRAIN PIPE		
	PROPOSED STORMWATER MANAGEMENT FACILITY				
	PROPOSED STREAM STABILIZATION CONCEPT				
	DENOTES CONSTRUCTION LIMITS IN CUT				
	DENOTES CONSTRUCTION LIMITS IN FILL				



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**

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 UPC 116269 (PROJECT # 0081-007-013)  
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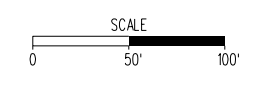


MATCH LINE I-81 NB STA. 2129+00, SB STA. 3129+00  
CONSTR. @ SEE SHEET 11

MATCH LINE I-81 NB STA. 2143+00, SB STA. 3143+00  
CONSTR. @ SEE SHEET 13

**I-81 NB CURVE DATA**  
 PI = 2119+85.47  
 DELTA =  $21^{\circ}12'25.22"$  (LT)  
 D =  $00^{\circ}59'45"$   
 T = 1,077.01'  
 L = 2,129.37'  
 R = 5,753.00'  
 PC = 2109+08.46  
 PT = 2130+37.83  
 e = 3.6%  
 V = 70 MPH

LEGEND:	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
	EXISTING VPRA R/W
	PROPOSED PERMANENT AERIAL EASEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT
	PROPOSED TEMPORARY EASEMENT
	PROPOSED PERMANENT EASEMENT
	RFP PROPOSED TEMPORARY AERIAL EASEMENT
	RFP PROPOSED TEMPORARY EASEMENT
	RFP PROPOSED PERMANENT EASEMENT
	PROPOSED BRIDGE
	MILL, OVERLAY AND BUILDUP
	FULL DEPTH PAVEMENT
	PAVEMENT DEMOLITION
	PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED STREAM STABILIZATION CONCEPT
	DENOTES CONSTRUCTION LIMITS IN CUT
	DENOTES CONSTRUCTION LIMITS IN FILL
	PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.
	PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED
	PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH
	PROPOSED LINED DITCH
	PROPOSED CONCRETE LINED DITCH
	PROPOSED STORM DRAIN PIPE
	SFW
	NATURAL GAS
	EXISTING WATER
	EXISTING ELECTRIC
	EXISTING FIBER OPTIC
	EXISTING CABLE TV
	EXISTING TELEPHONE
	EXISTING TRAFFIC CONTROL
	EXISTING UNKNOWN UTILITY



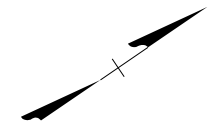
TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 12 OF 20



STC F.O. Marker No \*

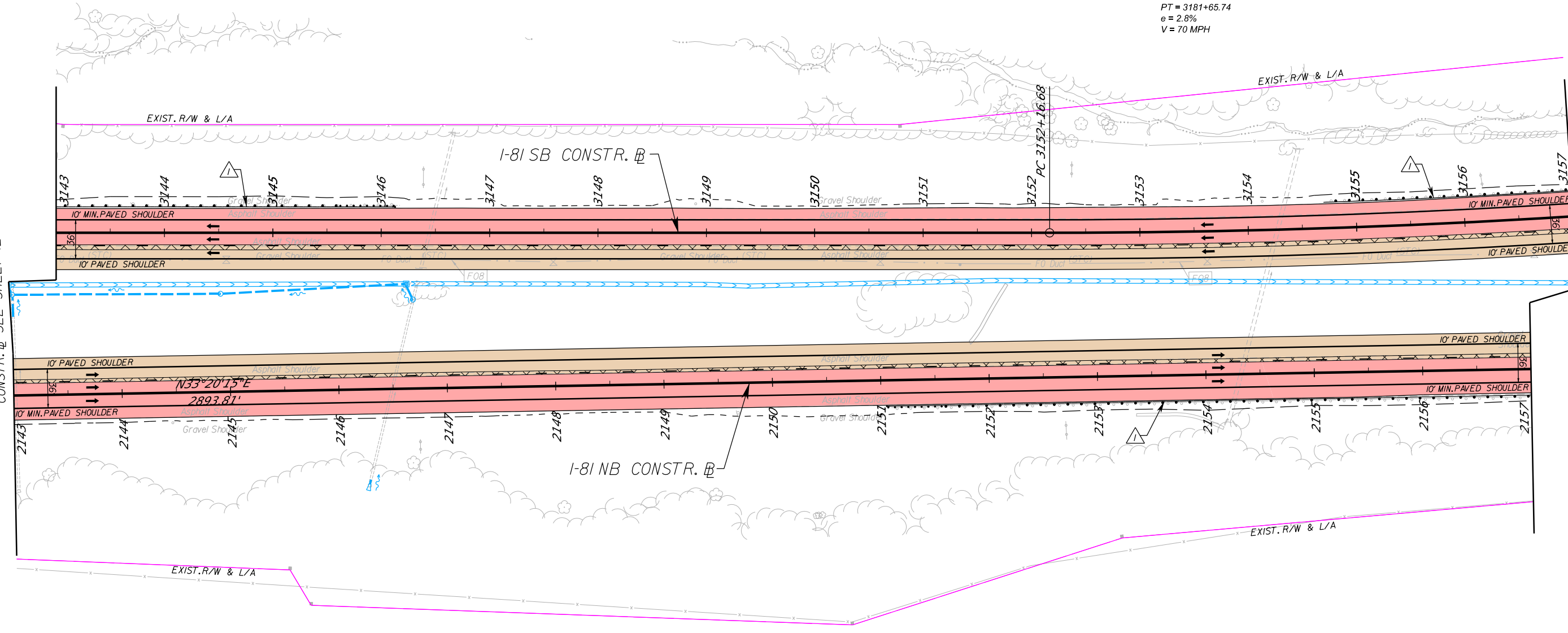
**I-81 SB CURVE DATA**

PI = 3167+09.59  
 DELTA = 21°59'53.56" (LT)  
 D = 00°44'45"  
 T = 1,492.91'  
 L = 2,949.05'  
 R = 7,681.00'  
 PC = 3152+16.68  
 PT = 3181+65.74  
 e = 2.8%  
 V = 70 MPH

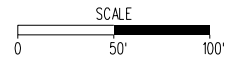


MATCH LINE I-81 NB STA. 2143+00, SB STA. 3143+00  
 CONSTR. @ SEE SHEET 12

MATCH LINE I-81 NB STA. 2157+00, SB STA. 3157+00  
 CONSTR. @ SEE SHEET 14



LEGEND:			
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED BRIDGE
	EXISTING VPRA R/W		MILL, OVERLAY AND BUILDUP
	PROPOSED PERMANENT AERIAL EASEMENT		FULL DEPTH PAVEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT		PAVEMENT DEMOLITION
	PROPOSED TEMPORARY EASEMENT		PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED PERMANENT EASEMENT		PROPOSED STREAM STABILIZATION CONCEPT
	RFP PROPOSED TEMPORARY AERIAL EASEMENT		DENOTES CONSTRUCTION LIMITS IN CUT
	RFP PROPOSED TEMPORARY EASEMENT		DENOTES CONSTRUCTION LIMITS IN FILL
	RFP PROPOSED PERMANENT EASEMENT		PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.		PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED		PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH		SFM
	PROPOSED LINED DITCH		NATURAL GAS
	PROPOSED CONCRETE LINED DITCH		EXISTING WATER
	PROPOSED STORM DRAIN PIPE		EXISTING ELECTRIC
			EXISTING FIBER OPTIC
			EXISTING CABLE TV
			EXISTING TELEPHONE
			EXISTING TRAFFIC CONTROL
			EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 13 OF 20



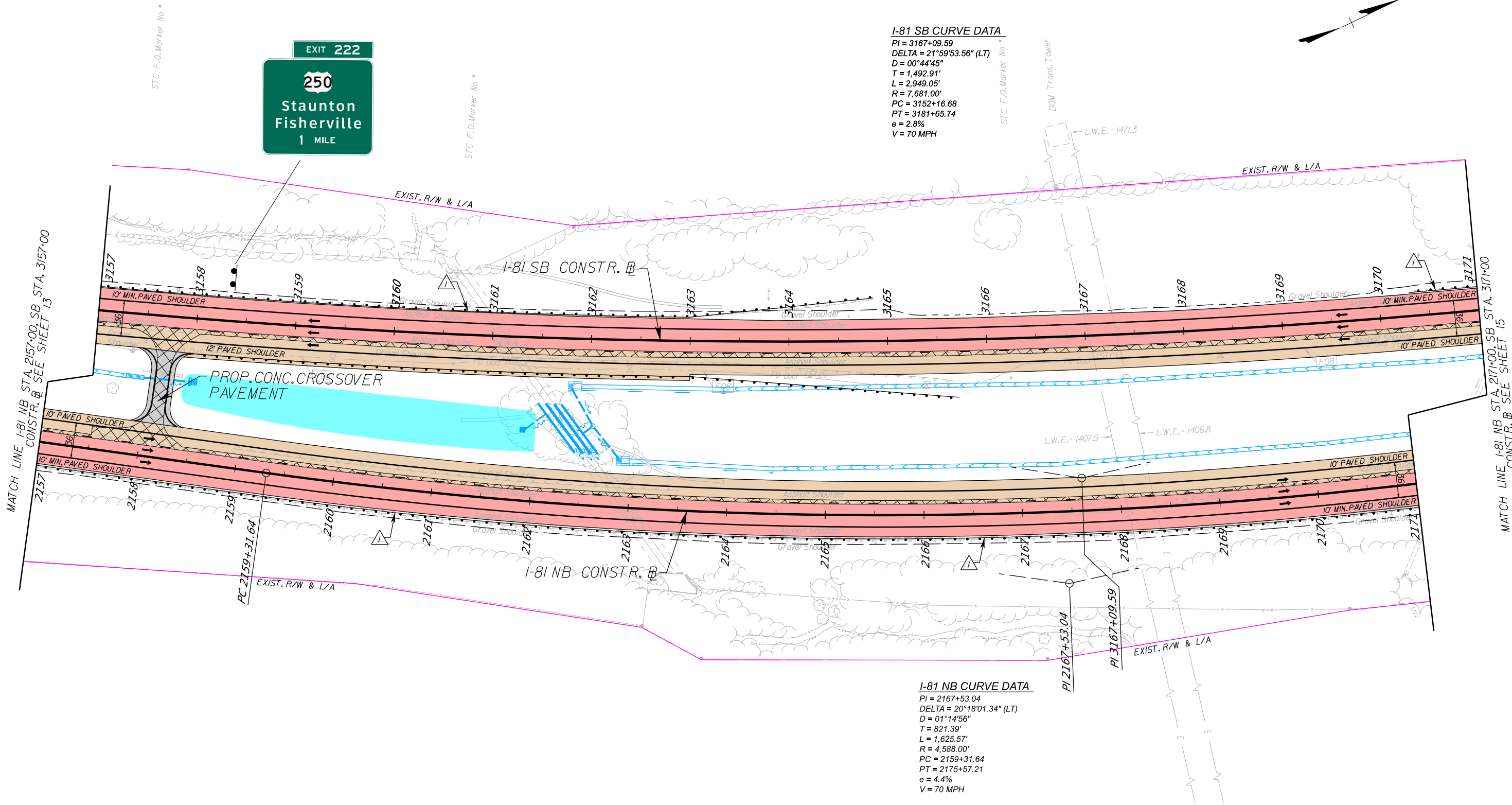


**I-81 SB CURVE DATA**  
 PI = 3167+09.59  
 DELTA = 21°59'53.56" (LT)  
 D = 00°44'45"  
 T = 1,492.91'  
 L = 2,949.05'  
 R = 7,681.00'  
 PC = 3152+16.68  
 PT = 3181+65.74  
 e = 2.8%  
 V = 70 MPH

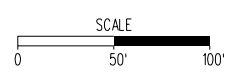
**I-81 NB CURVE DATA**  
 PI = 2167+53.04  
 DELTA = 20°18'01.34" (LT)  
 D = 01°14'56"  
 T = 821.39'  
 L = 1,625.57'  
 R = 4,588.00'  
 PC = 2159+31.64  
 PT = 2175+57.21  
 e = 4.4%  
 V = 70 MPH

MATCH LINE I-81 NB STA. 2157+00, SB STA. 3157+00  
 CONSTR. @ SEE SHEET 13

MATCH LINE I-81 NB STA. 2171+00, SB STA. 3171+00  
 CONSTR. @ SEE SHEET 15



LEGEND:	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
	EXISTING VPRA R/W
	PROPOSED PERMANENT AERIAL EASEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT
	PROPOSED TEMPORARY EASEMENT
	PROPOSED PERMANENT EASEMENT
	RFP PROPOSED TEMPORARY AERIAL EASEMENT
	RFP PROPOSED TEMPORARY EASEMENT
	RFP PROPOSED PERMANENT EASEMENT
	PROPOSED BRIDGE
	MILL OVERLAY AND BUILDUP
	FULL DEPTH PAVEMENT
	PAVEMENT DEMOLITION
	PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED STREAM STABILIZATION CONCEPT
	NOTES CONSTRUCTION LIMITS IN CUT
	NOTES CONSTRUCTION LIMITS IN FILL
	PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.
	PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED
	PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH
	PROPOSED LINED DITCH
	PROPOSED CONCRETE LINED DITCH
	PROPOSED STORM DRAIN PIPE
	SFM
	G
	EX
	E
	FO
	CATV
	T
	UC
	EX



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 14 OF 20



DE#3: NB I-81 sta. 2177+00 to 2181+50 - Median Varies 5.5' to 10' Varies 2.8' to 9.8' Rt. 254 Overpass

DE#4: SB I-81 sta. 3179+50 to 3184+00 - Median Varies 5.5' to 10' Varies 2.6' to 6.1' Rt. 254 Overpass

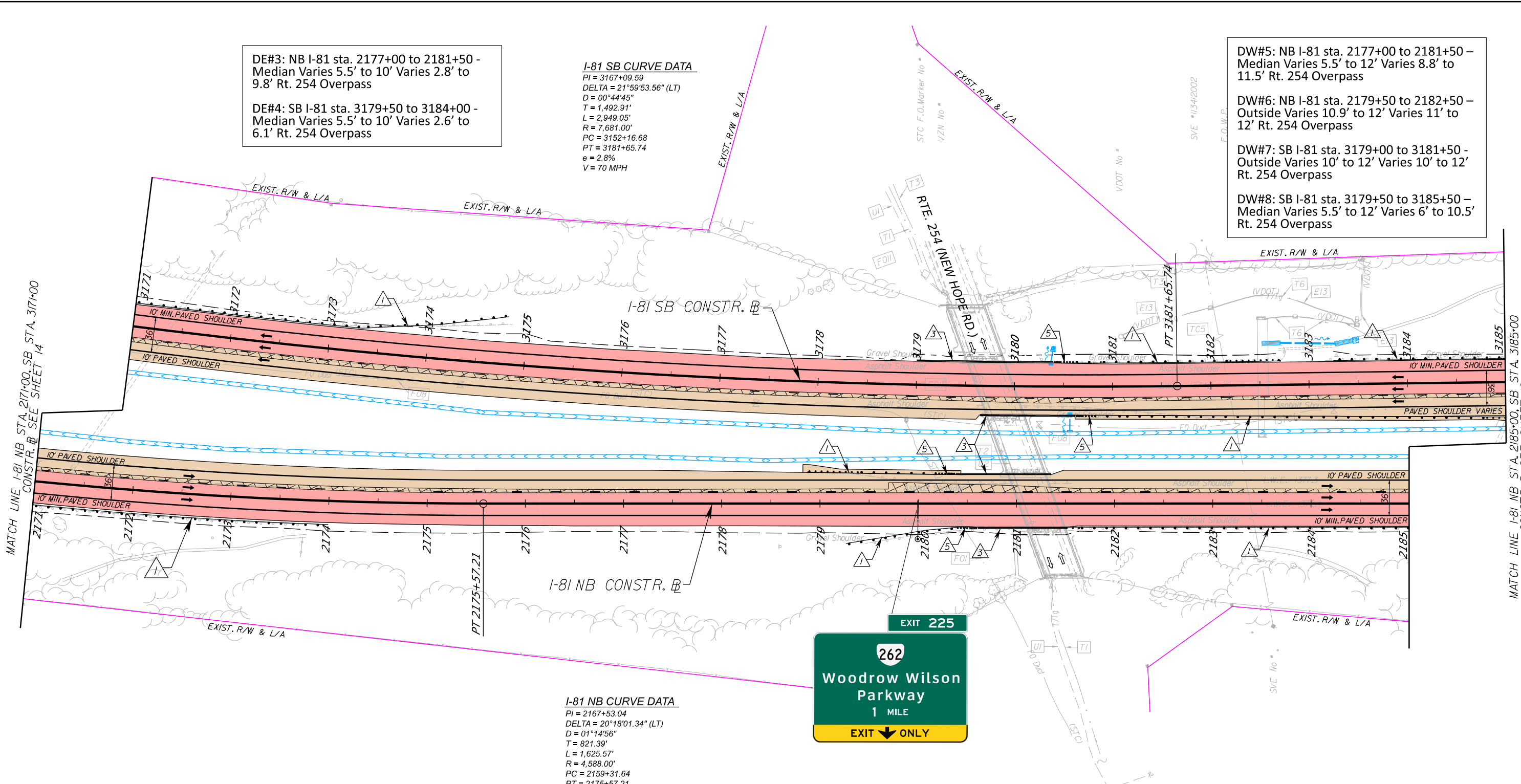
**I-81 SB CURVE DATA**  
 PI = 3167+09.59  
 DELTA = 21°59'53.56" (LT)  
 D = 00°44'45"  
 T = 1,492.91'  
 L = 2,949.05'  
 R = 7,681.00'  
 PC = 3152+16.68  
 PT = 3181+65.74  
 e = 2.8%  
 V = 70 MPH

DW#5: NB I-81 sta. 2177+00 to 2181+50 - Median Varies 5.5' to 12' Varies 8.8' to 11.5' Rt. 254 Overpass

DW#6: NB I-81 sta. 2179+50 to 2182+50 - Outside Varies 10.9' to 12' Varies 11' to 12' Rt. 254 Overpass

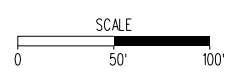
DW#7: SB I-81 sta. 3179+00 to 3181+50 - Outside Varies 10' to 12' Varies 10' to 12' Rt. 254 Overpass

DW#8: SB I-81 sta. 3179+50 to 3185+50 - Median Varies 5.5' to 12' Varies 6' to 10.5' Rt. 254 Overpass



**I-81 NB CURVE DATA**  
 PI = 2167+53.04  
 DELTA = 20°18'01.34" (LT)  
 D = 01°14'56"  
 T = 821.39'  
 L = 1,625.57'  
 R = 4,588.00'  
 PC = 2159+31.64  
 PT = 2175+57.21  
 e = 4.4%  
 V = 70 MPH

LEGEND:	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
	EXISTING VPRA R/W
	PROPOSED PERMANENT AERIAL EASEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT
	PROPOSED TEMPORARY EASEMENT
	PROPOSED PERMANENT EASEMENT
	RFP PROPOSED TEMPORARY AERIAL EASEMENT
	RFP PROPOSED TEMPORARY EASEMENT
	RFP PROPOSED PERMANENT EASEMENT
	PROPOSED BRIDGE
	MILL/OVERLAY AND BUILDUP
	FULL DEPTH PAVEMENT
	PAVEMENT DEMOLITION
	PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED STREAM STABILIZATION CONCEPT
	DENOTES CONSTRUCTION LIMITS IN CUT
	DENOTES CONSTRUCTION LIMITS IN FILL
	PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.
	PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED
	PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH
	PROPOSED LINED DITCH
	PROPOSED CONCRETE LINED DITCH
	PROPOSED STORM DRAIN PIPE
	SFW
	NATURAL GAS
	EXISTING WATER
	EXISTING ELECTRIC
	EXISTING FIBER OPTIC
	EXISTING CABLE TV
	EXISTING TELEPHONE
	EXISTING TRAFFIC CONTROL
	EXISTING UNKNOWN UTILITY



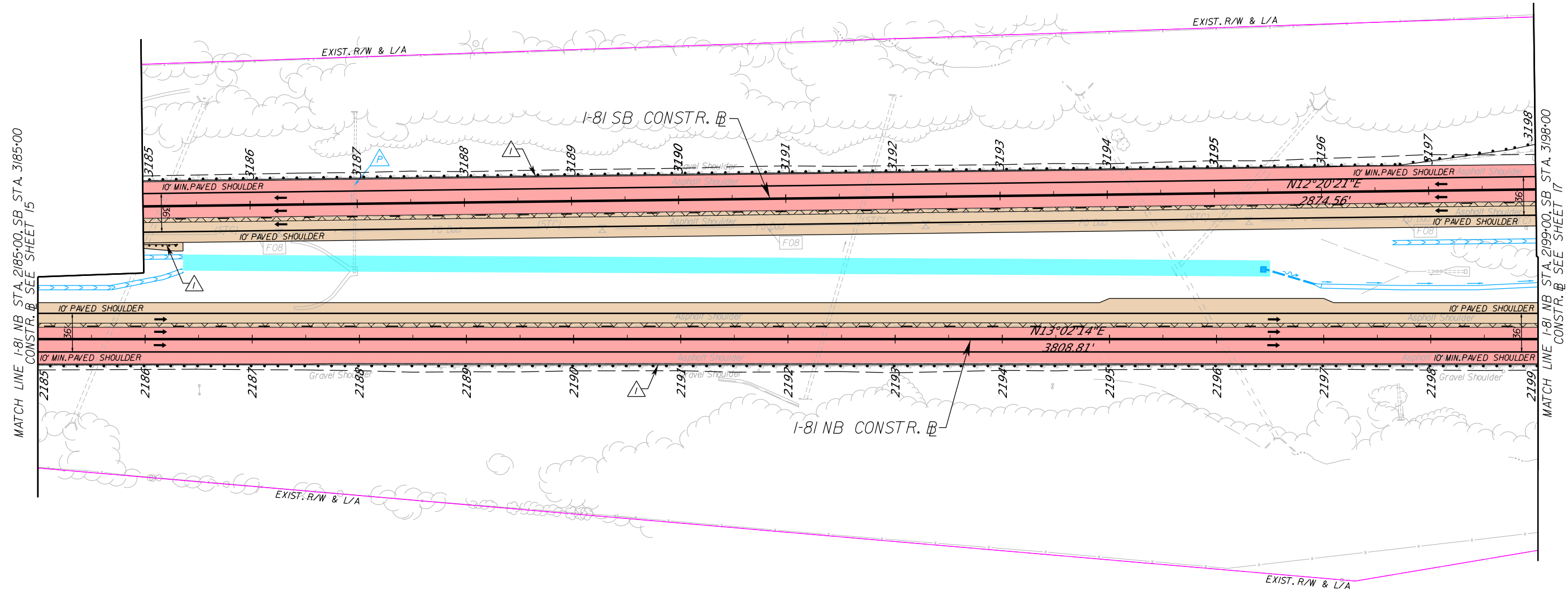
TECHNICAL PROPOSAL CONCEPTUAL DESIGN

I-81 WIDENING MM 221 TO MM 225

UPC 116269 (PROJECT # 0081-007-013)

SHEET 15 OF 20

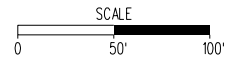




MATCH LINE I-81 NB STA. 2185+00, SB STA. 3185+00  
CONSTR. B SEE SHEET 15

MATCH LINE I-81 NB STA. 2199+00, SB STA. 3198+00  
CONSTR. B SEE SHEET 17

LEGEND:			
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED BRIDGE
	EXISTING VPRA R/W		MILL, OVERLAY AND BUILDUP
	PROPOSED PERMANENT AERIAL EASEMENT		FULL DEPTH PAVEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT		PAVEMENT DEMOLITION
	PROPOSED TEMPORARY EASEMENT		PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED PERMANENT EASEMENT		PROPOSED STREAM STABILIZATION CONCEPT
	RFP PROPOSED TEMPORARY AERIAL EASEMENT		DENOTES CONSTRUCTION LIMITS IN CUT
	RFP PROPOSED TEMPORARY EASEMENT		DENOTES CONSTRUCTION LIMITS IN FILL
	RFP PROPOSED PERMANENT EASEMENT		PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.		PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED		PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH		SFM
	PROPOSED LINED DITCH		NATURAL GAS
	PROPOSED CONCRETE LINED DITCH		EXISTING WATER
	PROPOSED STORM DRAIN PIPE		EXISTING ELECTRIC
			EXISTING FIBER OPTIC
			EXISTING CABLE TV
			EXISTING TELEPHONE
			EXISTING TRAFFIC CONTROL
			EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 16 OF 20







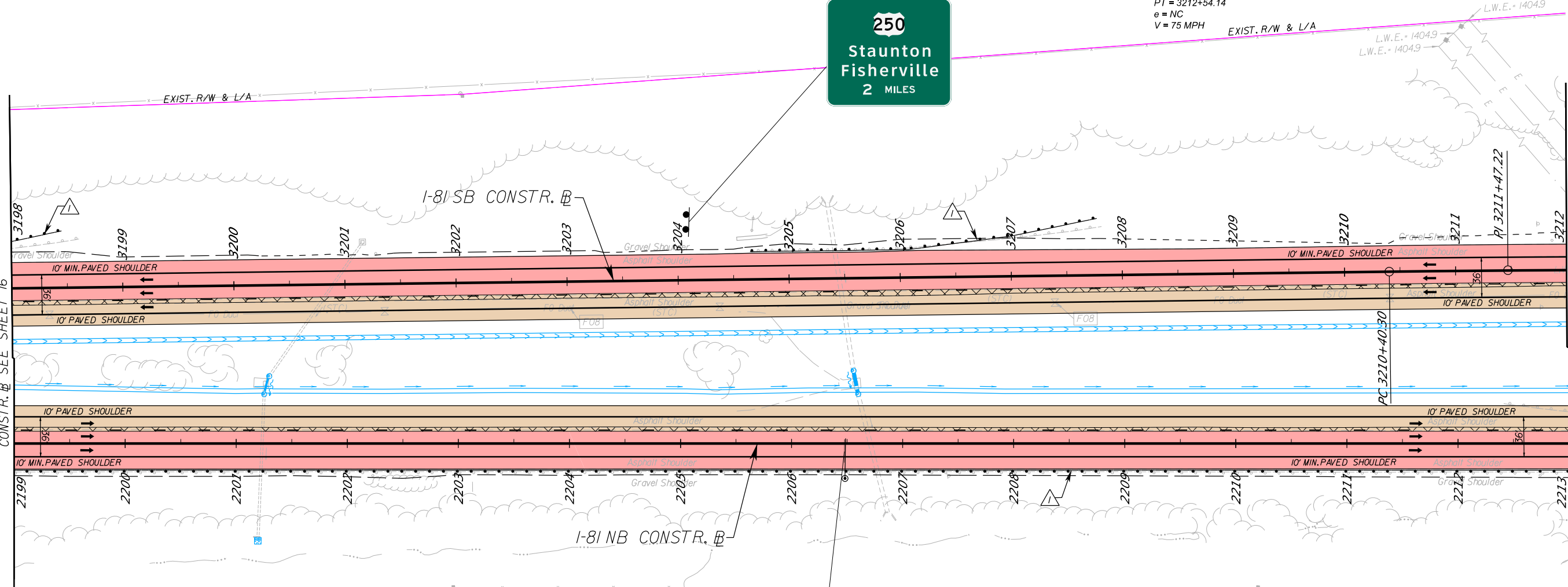
**I-81 SB CURVE DATA**  
 PI = 3211+47.22  
 DELTA = 00°36'45.38" (RT)  
 D = 00°17'11"  
 T = 106.92'  
 L = 213.84'  
 R = 20,000.00'  
 PC = 3210+40.30  
 PT = 3212+54.14  
 e = NC  
 V = 75 MPH

EXIT 222  
**250**  
 Staunton  
 Fisherville  
 2 MILES

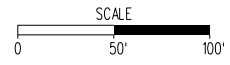
EXIT 225  
**262**  
 Woodrow Wilson  
 Parkway  
 1/2 MILE  
 EXIT ↓ ONLY

MATCH LINE I-81 NB STA. 2199+00, SB STA. 3198+00  
CONSTR. @ SEE SHEET 16

MATCH LINE I-81 NB STA. 2213+00, SB STA. 3212+00  
CONSTR. @ SEE SHEET 18

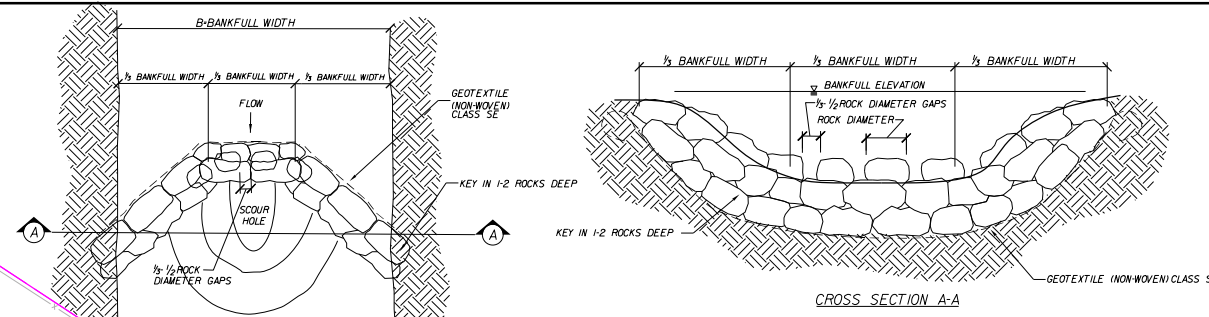


LEGEND:			
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED BRIDGE
	EXISTING VPRA R/W		MILL, OVERLAY AND BUILDUP
	PROPOSED PERMANENT AERIAL EASEMENT		FULL DEPTH PAVEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT		PAVEMENT DEMOLITION
	PROPOSED TEMPORARY EASEMENT		PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED PERMANENT EASEMENT		PROPOSED STREAM STABILIZATION CONCEPT
	RFP PROPOSED TEMPORARY AERIAL EASEMENT		DENOTES CONSTRUCTION LIMITS IN CUT
	RFP PROPOSED TEMPORARY EASEMENT		DENOTES CONSTRUCTION LIMITS IN FILL
	RFP PROPOSED PERMANENT EASEMENT		PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.		PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED		PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH		PROPOSED LINED DITCH
	PROPOSED CONCRETE LINED DITCH		PROPOSED STORM DRAIN PIPE
	SFM		SFM
	NATURAL GAS		EXISTING WATER
	EXISTING WATER		EXISTING ELECTRIC
	EXISTING ELECTRIC		EXISTING FIBER OPTIC
	EXISTING FIBER OPTIC		EXISTING CABLE TV
	EXISTING CABLE TV		EXISTING TELEPHONE
	EXISTING TELEPHONE		EXISTING TRAFFIC CONTROL
	EXISTING TRAFFIC CONTROL		EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 17 OF 20

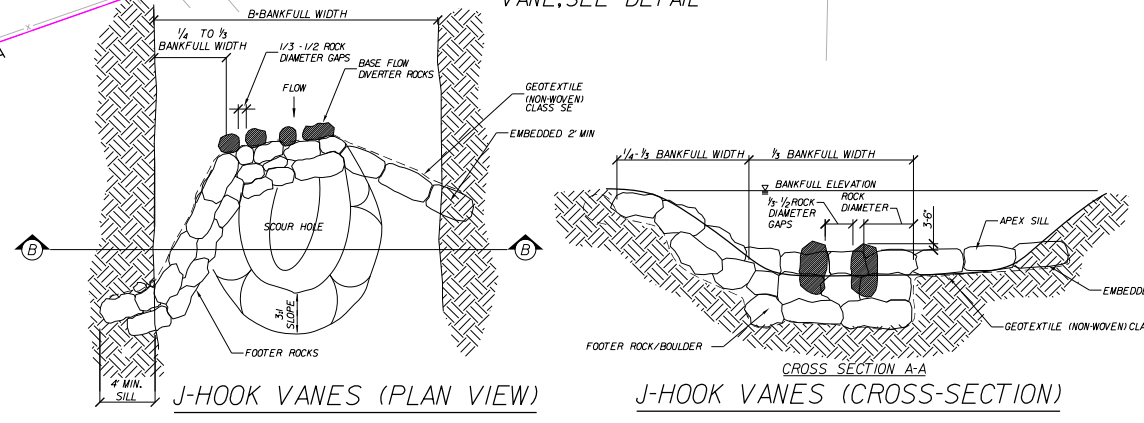
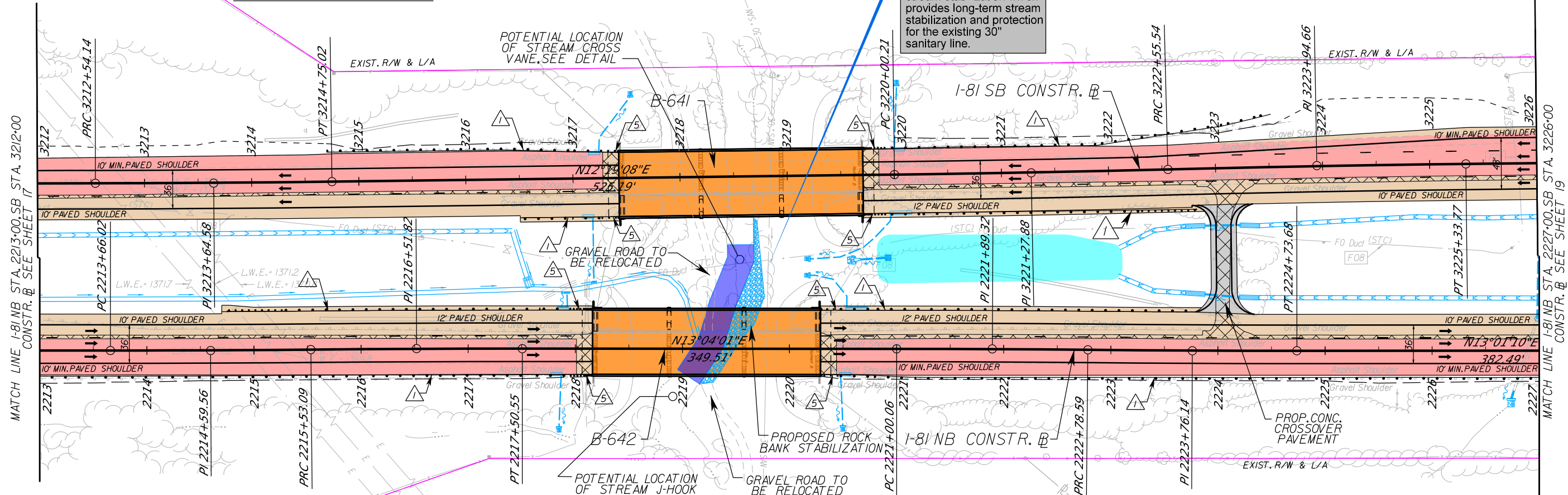




**I-81 SB CURVE DATA**

PI = 3211+47.22	PI = 3213+64.58	PI = 3221+27.88	PI = 3223+94.66
DELTA = 00°36'45.38" (RT)	DELTA = 00°37'58.03" (LT)	DELTA = 00°43'53.27" (LT)	DELTA = 00°47'49.44" (RT)
D = 00°17'11"	D = 00°17'11"	D = 00°17'11"	D = 00°17'11"
T = 106.92'	T = 110.44'	T = 127.67'	T = 139.12'
L = 213.84'	L = 220.88'	L = 255.33'	L = 278.23'
R = 20,000.00'	R = 20,000.00'	R = 20,000.00'	R = 20,000.00'
PC = 3210+40.30	PC = 3212+54.14	PC = 3220+00.21	PC = 3222+55.54
PT = 3212+54.14	PT = 3214+75.02	PT = 3222+55.54	PT = 3224+33.77
e = NC	e = NC	e = NC	e = NC
V = 75 MPH	V = 75 MPH	V = 75 MPH	V = 75 MPH

**DESIGN ENHANCEMENT**  
Improved hydraulics and stream stabilization which provides long-term stream stabilization and protection for the existing 30" sanitary line.



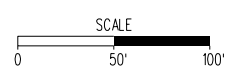
**I-81 NB CURVE DATA**

PI = 2214+59.56	PI = 2216+51.82	PI = 2221+89.32	PI = 2223+76.14
DELTA = 00°32'09.32" (LT)	DELTA = 00°33'56.40" (RT)	DELTA = 00°30'41.24" (RT)	DELTA = 00°33'32.06" (LT)
D = 00°17'11"	D = 00°17'11"	D = 00°17'11"	D = 00°17'11"
T = 93.54'	T = 98.73'	T = 89.27'	T = 97.55'
L = 187.07'	L = 197.46'	L = 178.53'	L = 195.09'
R = 20,000.00'	R = 20,000.00'	R = 20,000.00'	R = 20,000.00'
PC = 2213+66.02	PC = 2215+53.09	PC = 2221+00.06	PC = 2222+78.59
PT = 2215+53.09	PT = 2217+50.55	PT = 2222+78.59	PT = 2224+73.68
e = NC	e = NC	e = NC	e = NC
V = 75 MPH	V = 75 MPH	V = 75 MPH	V = 75 MPH

**LEGEND:**

EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	PROPOSED BRIDGE	PROPOSED GUARDRAIL REQ'D.	SFW
EXISTING VPRA R/W	MILL/OVERLAY AND BUILDUP	PROPOSED CONCRETE BARRIER REQ'D.	NATURAL GAS
PROPOSED PERMANENT AERIAL EASEMENT	FULL DEPTH PAVEMENT	PROPOSED PIER PROTECTION BARRIER REQ'D.	EXISTING WATER
PROPOSED PERMANENT BRIDGE EASEMENT	PAVEMENT DEMOLITION	NOT USED	EXISTING ELECTRIC
PROPOSED TEMPORARY EASEMENT	PROPOSED STORMWATER MANAGEMENT FACILITY	PROPOSED CURBING REQ'D.	EXISTING FIBER OPTIC
PROPOSED PERMANENT EASEMENT	PROPOSED STREAM STABILIZATION CONCEPT	PROPOSED GRASS DITCH	EXISTING CABLE TV
RFP PROPOSED TEMPORARY AERIAL EASEMENT		PROPOSED LINED DITCH	EXISTING TELEPHONE
RFP PROPOSED PERMANENT AERIAL EASEMENT		PROPOSED CONCRETE LINED DITCH	EXISTING TRAFFIC CONTROL
RFP PROPOSED TEMPORARY EASEMENT		PROPOSED STORM DRAIN PIPE	EXISTING UNKNOWN UTILITY
RFP PROPOSED PERMANENT EASEMENT			

DENOTES CONSTRUCTION LIMITS IN CUT  
 DENOTES CONSTRUCTION LIMITS IN FILL



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
I-81 WIDENING MM 221 TO MM 225  
UPC 116269 (PROJECT # 0081-007-013)  
SHEET 18 OF 20





**RTE. 262 RAMP C CURVE DATA**

PI = 40+85.73  
 DELTA = 02°33'15.74" (LT)  
 D = 01°28'47"  
 T = 86.33'  
 L = 172.62'  
 R = 3,872.00'  
 PC = 39+99.41  
 PT = 41+72.03  
 e = EXIST.  
 V = 45 MPH

**I-81 SB CURVE DATA**

PI = 3238+14.28  
 DELTA = 28°14'51.54" (RT)  
 D = 01°29'20"  
 T = 968.25'  
 L = 1,897.12'  
 R = 3,848.00'  
 PC = 3228+46.03  
 PT = 3247+43.15  
 e = 5.8%  
 V = 75 MPH

**DESIGN ENHANCEMENT**

Reduced 2'-8" lane shift to minimize cross slope correction impacts to temporary drainage and reduce driver impacts.

**DESIGN ENHANCEMENT**

Replaced 1000-foot Lane Shift with 75 MPH Curve From Sta 2228+56 to Sta 2235+56 which provides a smoother and safer transition for drivers.

**DESIGN ENHANCEMENT**

Maintained the existing auxiliary lane as additional full-depth paved shoulder which reduces cost to future I-81 widening projects and safety of the traveling public.



**I-81 NB CURVE DATA**

PI = 2232+06.74	PI = 2242+18.46
DELTA = 08°01'17.07 (RT)	DELTA = 19°52'32.77" (RT)
D = 01°08'45"	D = 01°30'57"
T = 350.57'	T = 662.29'
L = 700.00'	L = 1,311.27'
R = 5,000.00'	R = 3,780.00'
PC = 2228+56.17	PC = 2235+56.17
PT = 2235+56.17	PT = 2248+56.17
e = 4.7%	e = 5.9%
V = 75 MPH	V = 75 MPH

**RTE. 262 RAMP A CURVE DATA**

PI = 12+28.07	PI = 15+25.45
DELTA = 22°14'45.24" (RT)	DELTA = 05°43'19.02" (RT)
D = 04°56'21"	D = 03°48'53"
T = 228.07'	T = 75.06'
L = 450.39'	L = 150.00'
R = 1,160.00'	R = 1,502.00'
PC = 10+00.00	PC = 14+50.39
PT = 14+50.39	PT = 16+00.39
e = 5.5%	e = 4.6%
V = 40 MPH	V = 40 MPH

- LEGEND:**
- EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
  - EXISTING VPRA R/W
  - PROPOSED PERMANENT AERIAL EASEMENT
  - PROPOSED PERMANENT BRIDGE EASEMENT
  - PROPOSED TEMPORARY EASEMENT
  - PROPOSED PERMANENT EASEMENT
  - RFP PROPOSED TEMPORARY AERIAL EASEMENT
  - RFP PROPOSED TEMPORARY EASEMENT
  - RFP PROPOSED PERMANENT EASEMENT

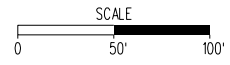
- PROPOSED BRIDGE
- MILL/OVERLAY AND BUILDUP
- FULL DEPTH PAVEMENT
- PAVEMENT DEMOLITION
- PROPOSED STORMWATER MANAGEMENT FACILITY
- PROPOSED STREAM STABILIZATION CONCEPT

- PROPOSED GUARDRAIL REQ'D.
- PROPOSED CONCRETE BARRIER REQ'D.
- PROPOSED PIER PROTECTION BARRIER REQ'D.
- NOT USED
- PROPOSED CURBING REQ'D.

- PROPOSED GRASS DITCH
- PROPOSED LINED DITCH
- PROPOSED CONCRETE LINED DITCH
- PROPOSED STORM DRAIN PIPE

- SFM - SFM
- G - NATURAL GAS
- 24W - EXISTING WATER
- E - EXISTING ELECTRIC
- FO - EXISTING FIBER OPTIC
- CVT - EXISTING CABLE TV
- T/TS - EXISTING TELEPHONE
- TC - EXISTING TRAFFIC CONTROL
- UNK - EXISTING UNKNOWN UTILITY

C DENOTES CONSTRUCTION LIMITS IN CUT  
 F DENOTES CONSTRUCTION LIMITS IN FILL



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**

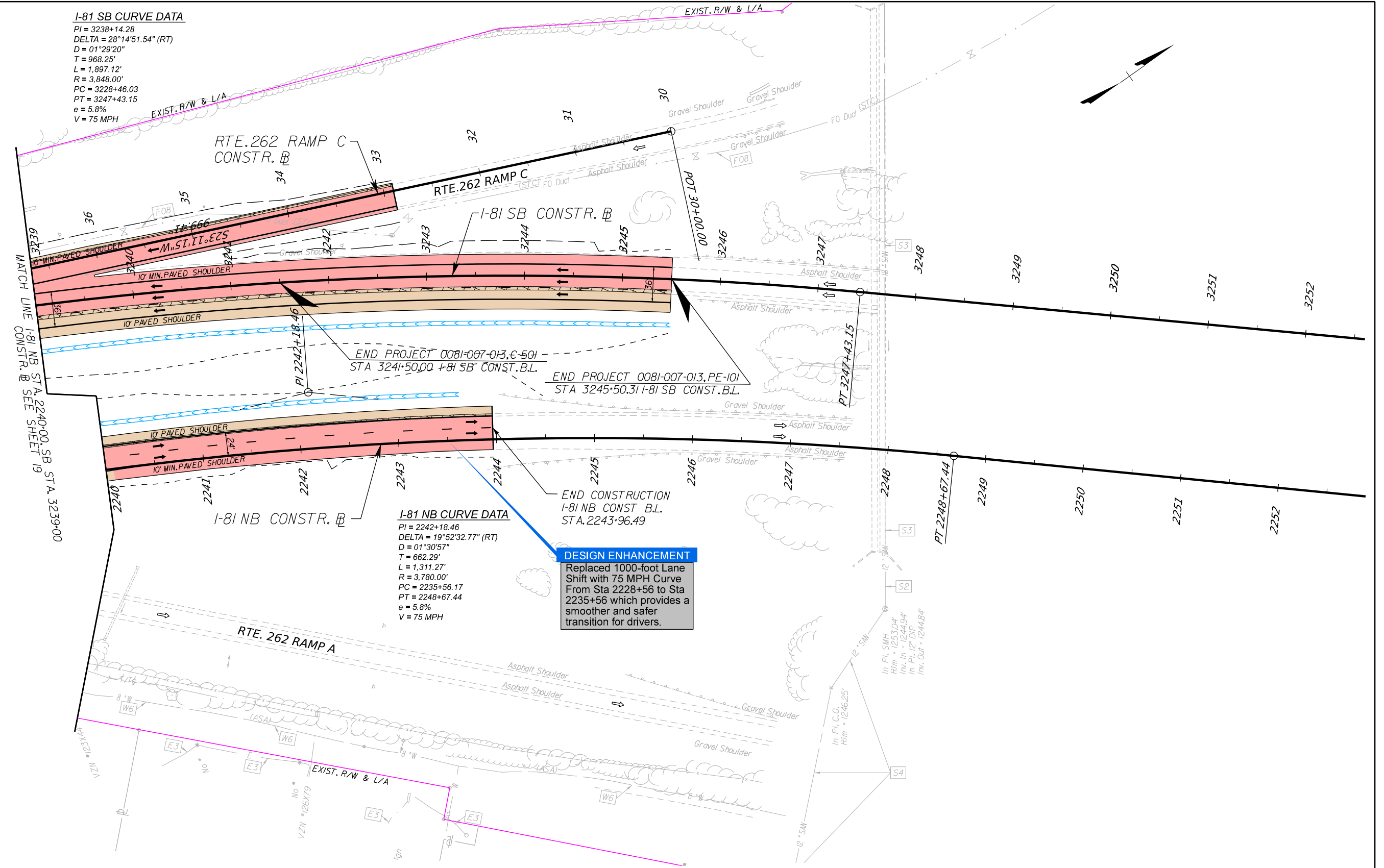
I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 19 OF 20



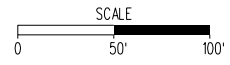
**I-81 SB CURVE DATA**  
 PI = 3238+14.28  
 DELTA = 28°14'51.54" (RT)  
 D = 01°29'20"  
 T = 968.25'  
 L = 1,897.12'  
 R = 3,848.00'  
 PC = 3228+46.03  
 PT = 3247+43.15  
 e = 5.8%  
 V = 75 MPH

**I-81 NB CURVE DATA**  
 PI = 2242+18.46  
 DELTA = 19°52'32.77" (RT)  
 D = 01°30'57"  
 T = 662.29'  
 L = 1,311.27'  
 R = 3,780.00'  
 PC = 2235+56.17  
 PT = 2248+67.44  
 e = 5.8%  
 V = 75 MPH

**DESIGN ENHANCEMENT**  
 Replaced 1000-foot Lane Shift with 75 MPH Curve From Sta 2228+56 to Sta 2235+56 which provides a smoother and safer transition for drivers.



LEGEND:	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
	EXISTING VPRA R/W
	PROPOSED PERMANENT AERIAL EASEMENT
	PROPOSED PERMANENT BRIDGE EASEMENT
	PROPOSED TEMPORARY EASEMENT
	PROPOSED PERMANENT EASEMENT
	RFP PROPOSED PERMANENT AERIAL EASEMENT
	RFP PROPOSED TEMPORARY EASEMENT
	RFP PROPOSED PERMANENT EASEMENT
	PROPOSED BRIDGE
	MILL/OVERLAY AND BUILDUP
	FULL DEPTH PAVEMENT
	PAVEMENT DEMOLITION
	PROPOSED STORMWATER MANAGEMENT FACILITY
	PROPOSED STREAM STABILIZATION CONCEPT
	DENOTES CONSTRUCTION LIMITS IN CUT
	DENOTES CONSTRUCTION LIMITS IN FILL
	PROPOSED GUARDRAIL REQ'D.
	PROPOSED CONCRETE BARRIER REQ'D.
	PROPOSED PIER PROTECTION BARRIER REQ'D.
	NOT USED
	PROPOSED CURBING REQ'D.
	PROPOSED GRASS DITCH
	PROPOSED LINED DITCH
	PROPOSED CONCRETE LINED DITCH
	PROPOSED STORM DRAIN PIPE
	SFM
	NATURAL GAS
	EXISTING WATER
	EXISTING ELECTRIC
	EXISTING FIBER OPTIC
	EXISTING CABLE TV
	EXISTING TELEPHONE
	EXISTING TRAFFIC CONTROL
	EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 221 TO MM 225  
 UPC 116269 (PROJECT # 0081-007-013)  
 SHEET 20 OF 20





# B. Structure Design

STATE	ROUTE	FEDERAL AID PROJECT	ROUTE	STATE PROJECT	SHEET NO.
VA.		NHPP-081-2(329)	81	0081-007-013, B638	1
Federal Structure No.		00000000001791	FHWA Construction and Scour Code: X271-SN		
Federal Stewardship and Oversight Code:				UPC No. 116269	

**DESIGN EXCEPTIONS:**

1. Reduced shoulder widths.
2. Modified BPB-4 parapet.

**EXISTING STRUCTURE GENERAL NOTES:**

Capacity: HS-20-44 loading and Bureau of Public Roads modified loading for military vehicles.

**Specifications:**

General: Virginia Department of Highways Road and Bridge Specifications, 1958.

Design: AASHTO Standard Specifications for Highway Bridges, 1961.

**PROPOSED STRUCTURE GENERAL NOTES:**

The original approved sheet, including original signatures, is filed in the VDOT Central Office. Any misuse of electronic files, including scanned signatures, is illegal. Violators will be prosecuted to the full extent of the applicable laws.

Width: 53'-6" face-to-face of curbs.

Span layout: 65'-8" - 69'-8" - 69'-0" steel beams.

Capacity: HL-93 loading.

**Specifications:**

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2020.

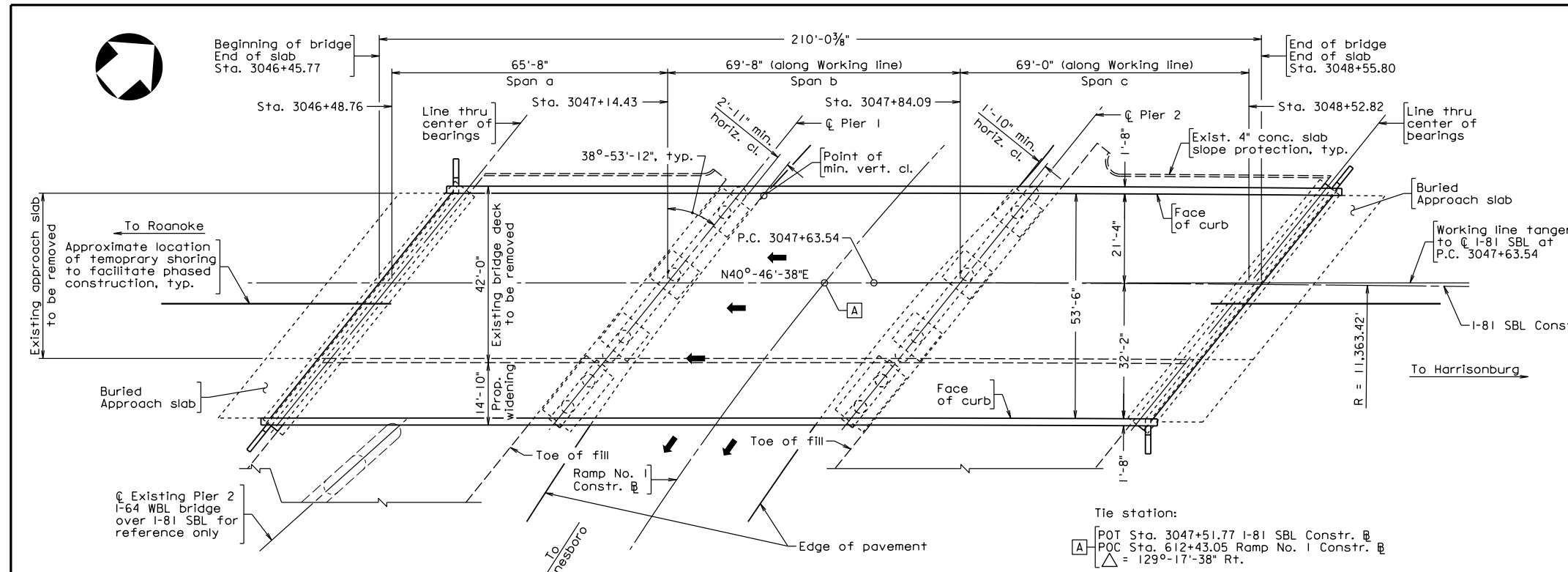
Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications.

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

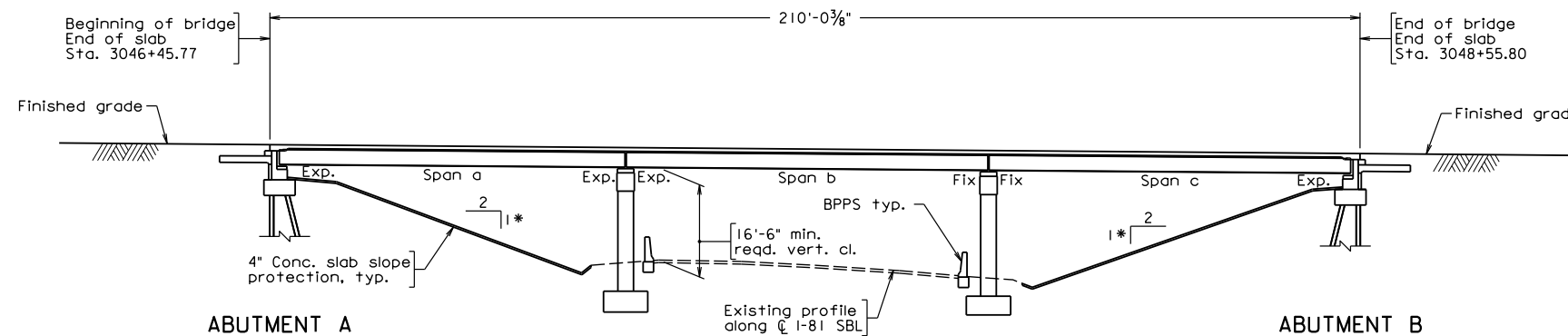
These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

Virginia Structure No. of existing bridge is 2028. Plan No. 193-09, 193-09A and 193-09B.

The existing structure is designated a Type B structure in accordance with Sec. 411.



**PLAN**

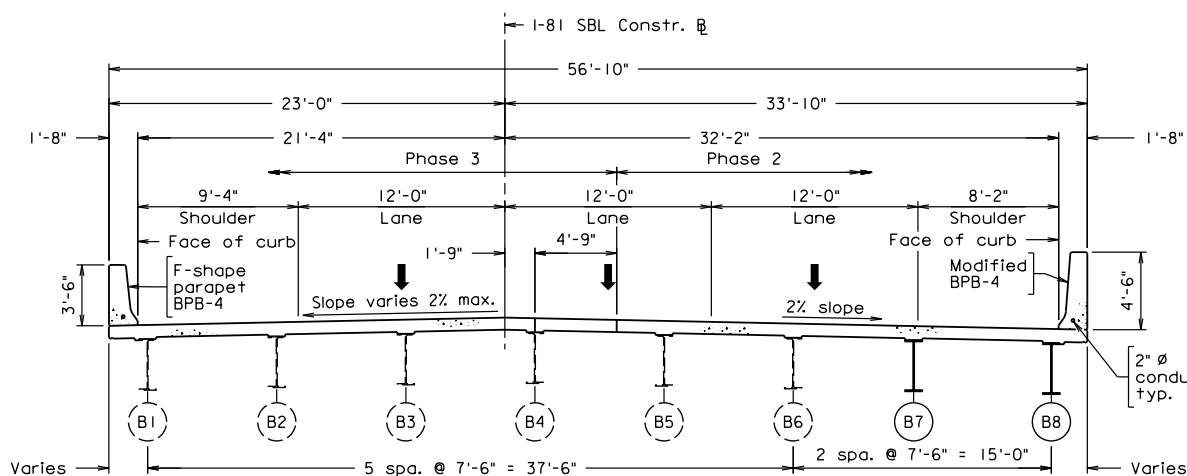


ABUTMENT A

PIER 1  
PIER 2  
DEVELOPED SECTION ALONG  $\bar{C}$  I-81 SBL

ABUTMENT B

\*Normal to abutment



**TRANSVERSE SECTION**  
Scale: 1/16" = 1'-0"

Scale: 1/16" = 1'-0" unless otherwise noted.

**PRELIMINARY PLANS**

THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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

Recommended for Approval: \_\_\_\_\_ Date \_\_\_\_\_  
District Project Development Engineer

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
District Administrator

Date: \_\_\_\_\_ © 2023, Commonwealth of Virginia Sheet 1 of 15

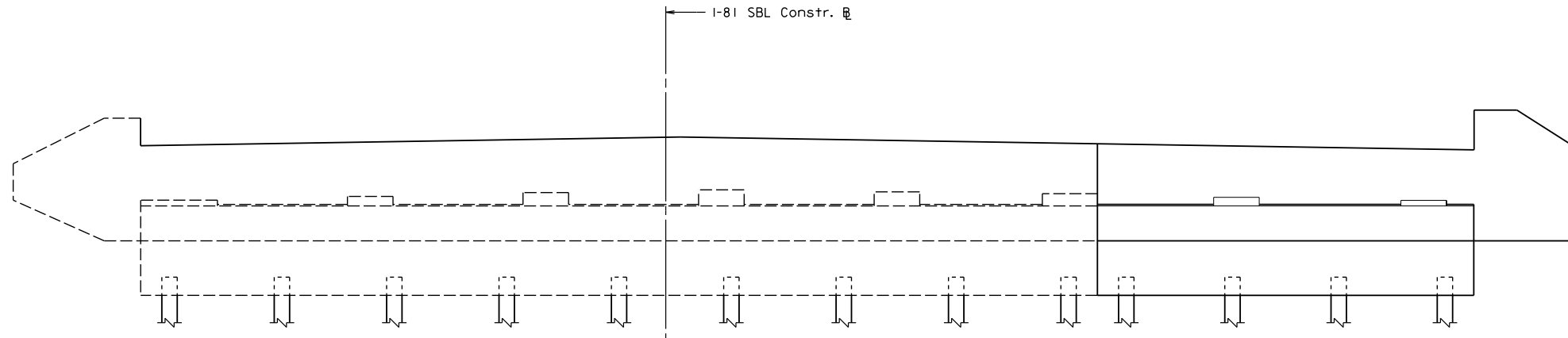
WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER

PLANS BY: Whitman Requardt and Assoc.  
COORDINATED:  
SUPERVISED:  
DESIGNED:  
DRAWN:  
CHECKED:



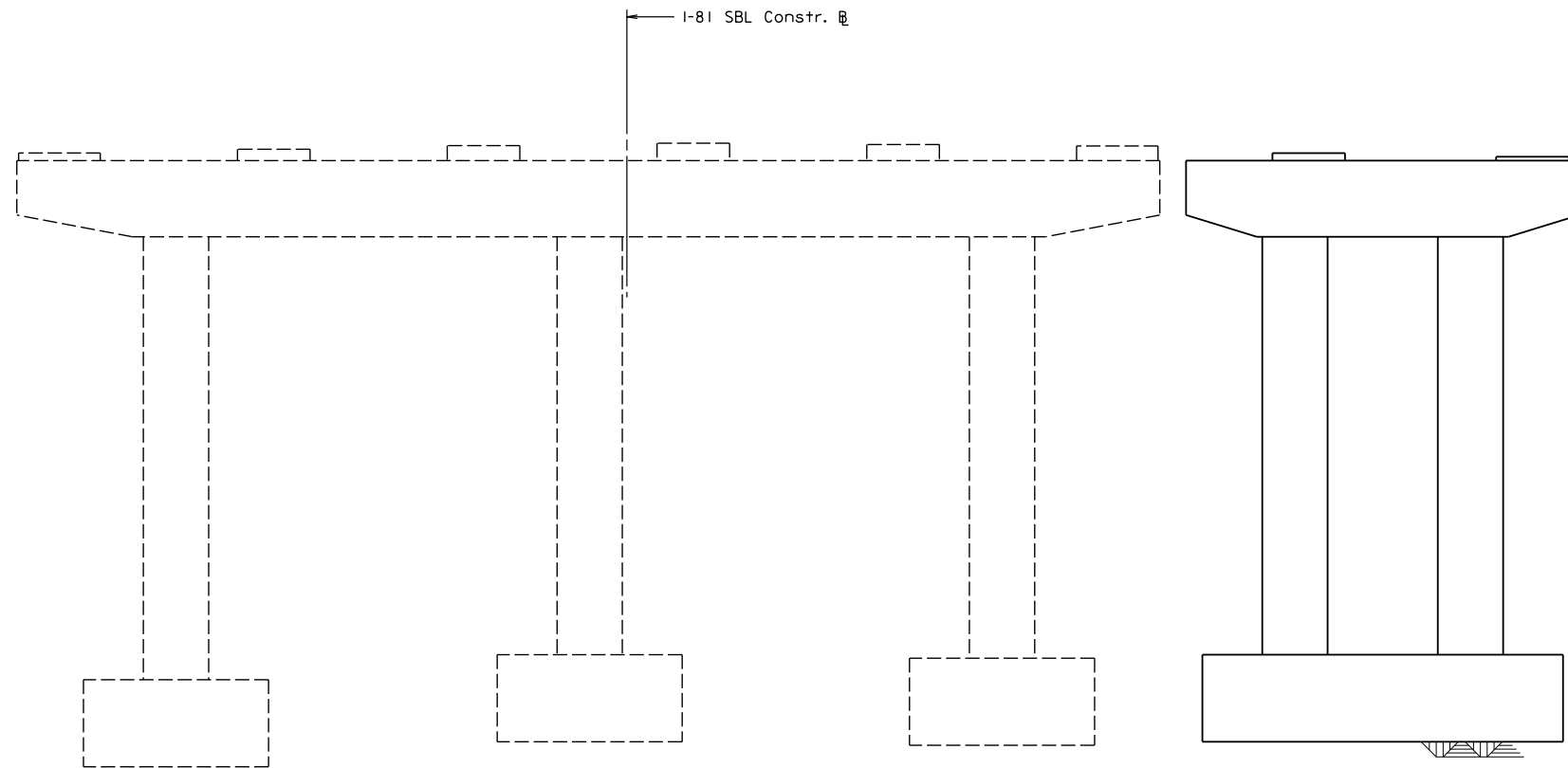
**VDOT**  
COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION  
PROPOSED BRIDGE REPAIRS AND WIDENING  
I-81 SBL OVER RAMP 1  
AUGUSTA COUNTY - 0.62 MI. S. OF RTE. 250  
PROJECT 0081-007-013, B638

STATE	FEDERAL AID		STATE		SHEET
VA.	ROUTE	PROJECT	ROUTE	PROJECT	NO.
			81	0081-007-013, B638	2



**ABUTMENT B ELEVATION**

Abutment A similar opposite hand.  
Limits of demolition/removal are not shown.



**TYPICAL PIER ELEVATION**

Pier 1 shown, Pier 2 similar.

WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER



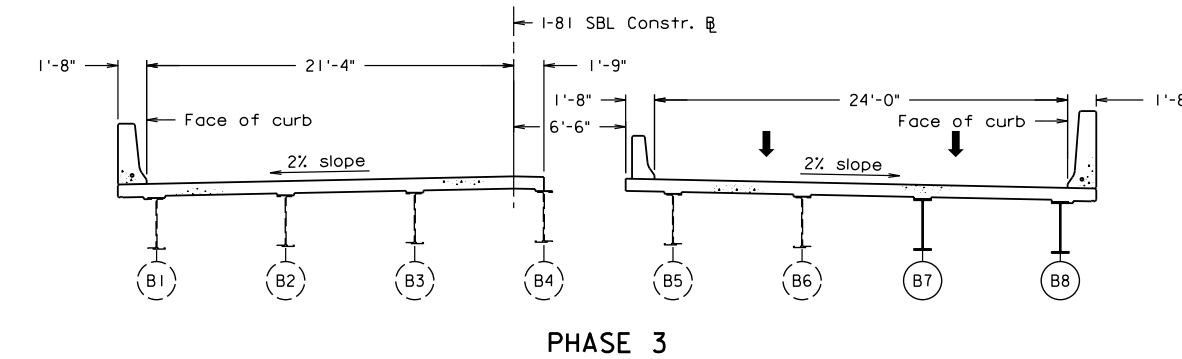
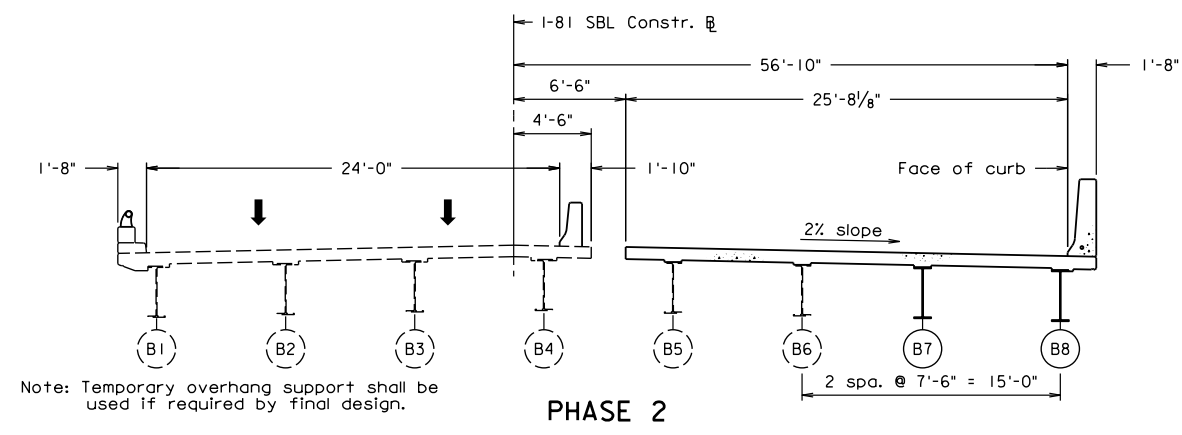
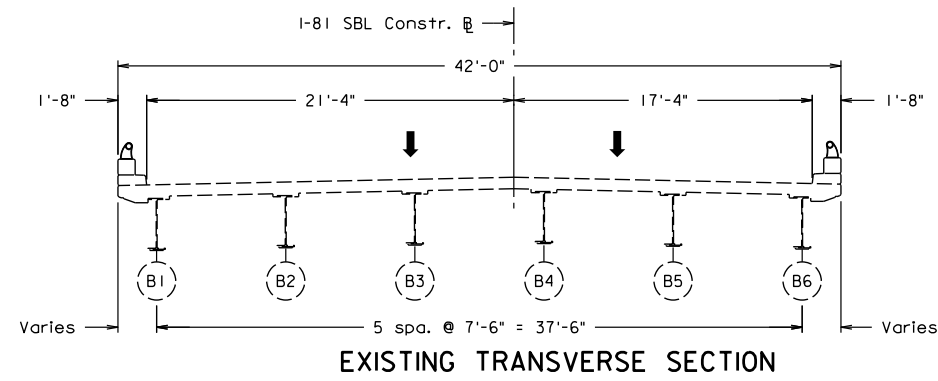
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**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED  
FOR CONSTRUCTION

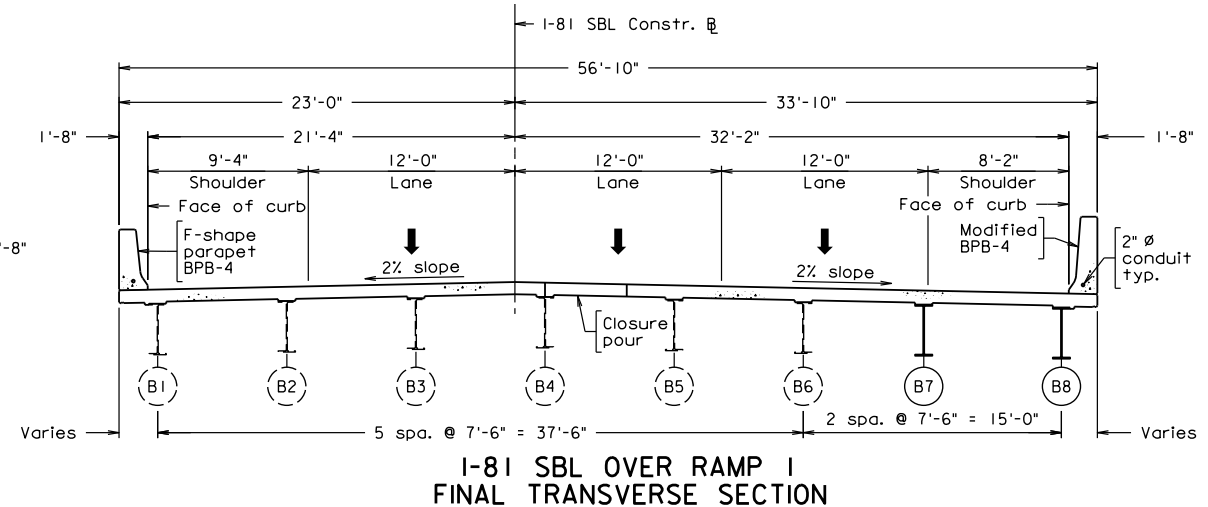
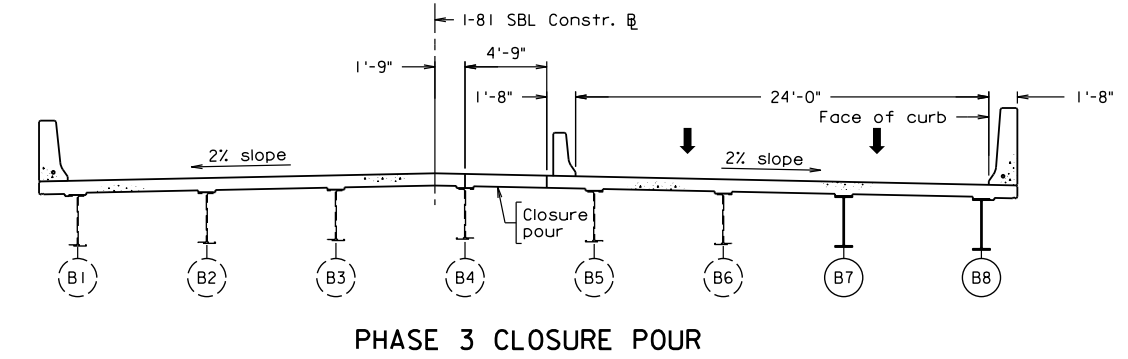
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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
<b>GENERAL SUBSTRUCTURE MODIFICATIONS FOR WIDENING</b>				
No.	Description	Date	Designed: WRA..... Drawn: WRA..... Checked: WRA.....	Date Jan. 2023
Revisions			Plan No. 193-09C	Sheet No. 2 of 15

STATE	FEDERAL AID		STATE	SHEET
VA.	ROUTE	PROJECT	ROUTE	NO.
			81	3
			0081-007-013, B638	



Note: Temporary overhang support shall be used if required by final design.



WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER



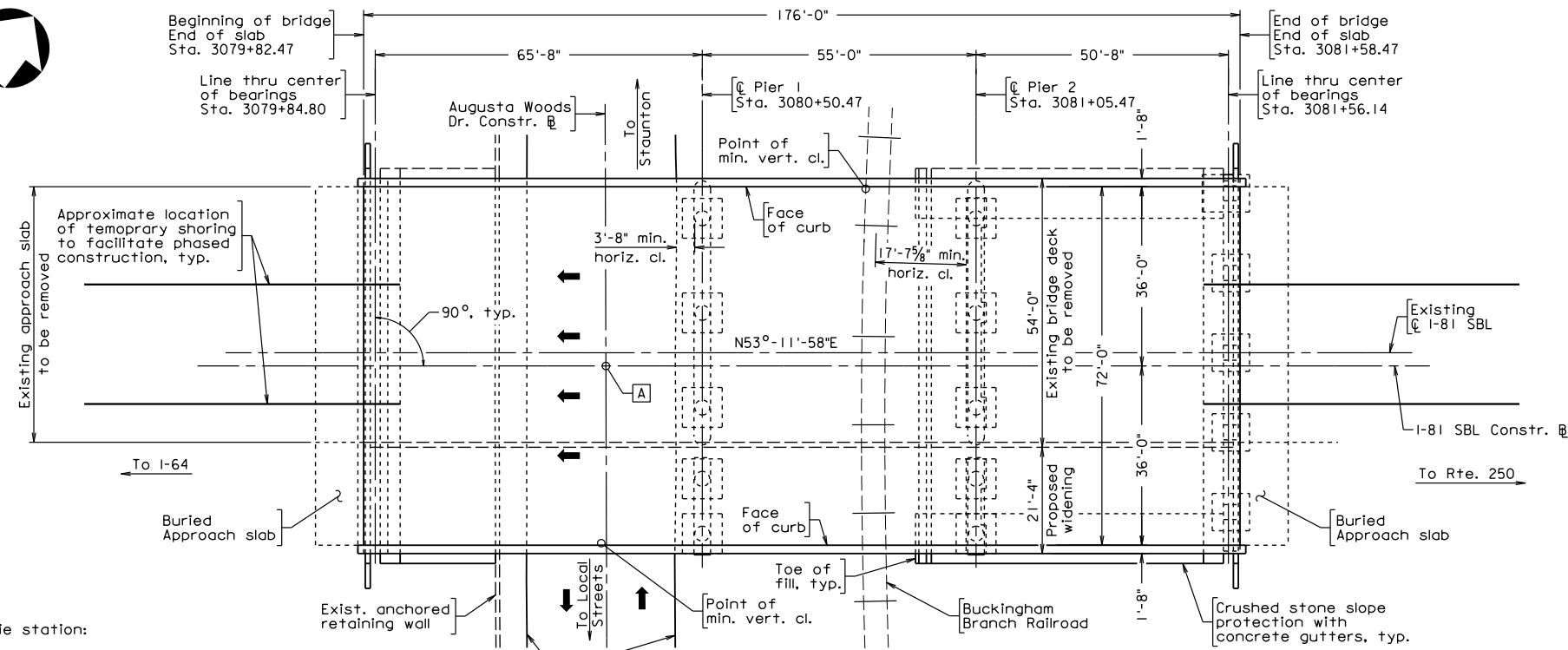
**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

Scale: 3/16" = 1'-0"

© 2023, Commonwealth of Virginia

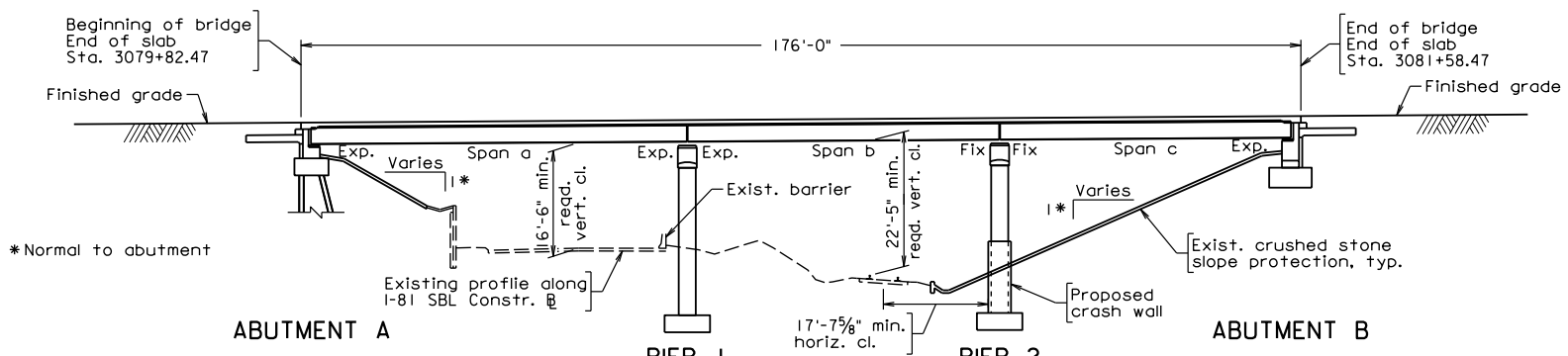
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
<b>SEQUENCE OF CONSTRUCTION</b>			
No.	Description	Date	Revisions
Designed: WRA	Date	Plan No.	Sheet No.
Drawn: WRA	Jan. 2023	193-09C	3 of 15
Checked: WRA			



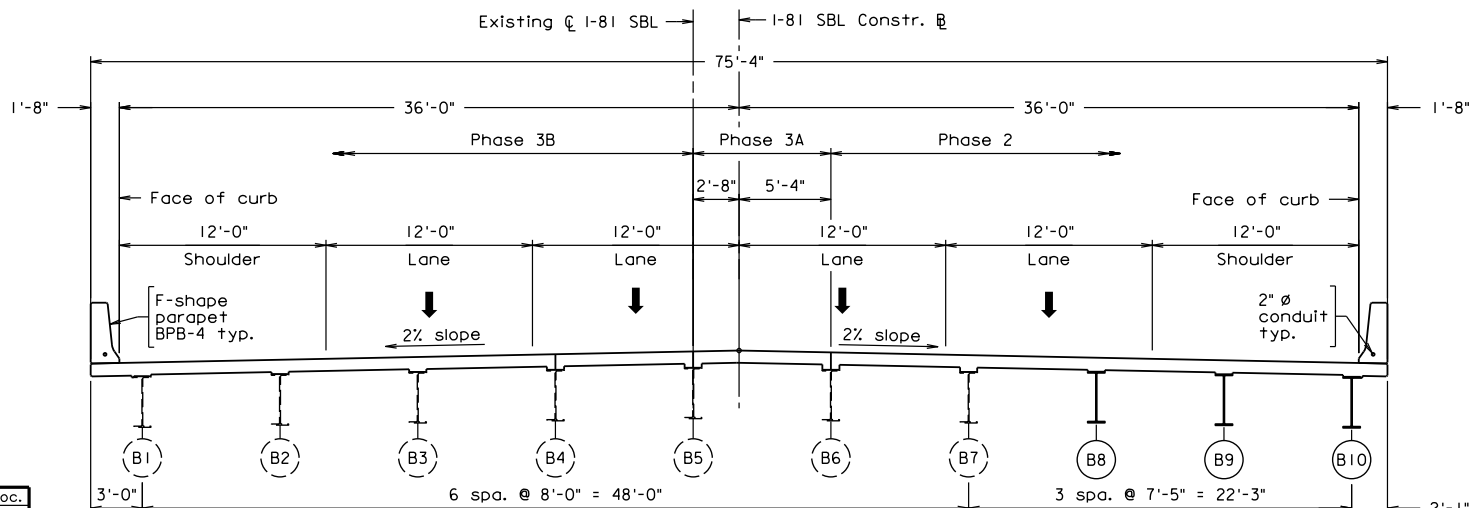


PLAN

Tie station:  
 A POT Sta. 3080+31.12 I-81 SBL Constr.  $\square$   
 POT Sta. 4003+37.86 Augusta Woods Dr.  $\triangle$   
 = 89°-49'-19" Rt.



DEVELOPED SECTION ALONG I-81 SBL CONSTR.  $\square$



TRANSVERSE SECTION

Scale: 1/16" = 1'-0"

Scale: 1/16" = 1'-0" unless otherwise noted.

WHITMAN REQUARDT & ASSOCIATES  
 RICHMOND, VA  
 STRUCTURAL ENGINEER  
 PLANS BY: Whitman Requardt and Assoc.  
 COORDINATED:  
 SUPERVISED:  
 DESIGNED:  
 DRAWN:  
 CHECKED:



**PRELIMINARY PLANS**  
 THESE PLANS NOT TO BE USED  
 FOR CONSTRUCTION

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

STATE	FEDERAL AID	STATE	SHEET NO.
VA.	NHPP-081-2(329)	81	0081-007-013, B639
Federal Structure No. 00000000001808		FHWA Construction and Scour Code: X271-SN	
Federal Stewardship and Oversight Code: F0		UPC No. 116269	

DESIGN EXCEPTION(S):

EXISTING STRUCTURE GENERAL NOTES:

Capacity: HS-20-44 loading and Bureau of Public Roads modified loading for military vehicles.

Specifications:

General: Virginia Department of Highways Road and Bridge Specifications, 1958.

Design: AASHTO Standard Specifications for Highway Bridges, 1961.

PROPOSED STRUCTURE GENERAL NOTES:

The original approved sheet, including original signatures, is filed in the VDOT Central Office. Any misuse of electronic files, including scanned signatures, is illegal. Violators will be prosecuted to the full extent of the applicable laws.

Width: 72'-0" face-to-face of curbs.

Span layout: 65'-8" - 55'-0" - 50'-8" steel beams.

Capacity: HL-93 loading.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2020.

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; 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.

Virginia Structure No. of existing bridge is 2045. Plan No. 193-07 and 193-07A.

The existing structure is designated a Type B structure in accordance with Sec. 411.



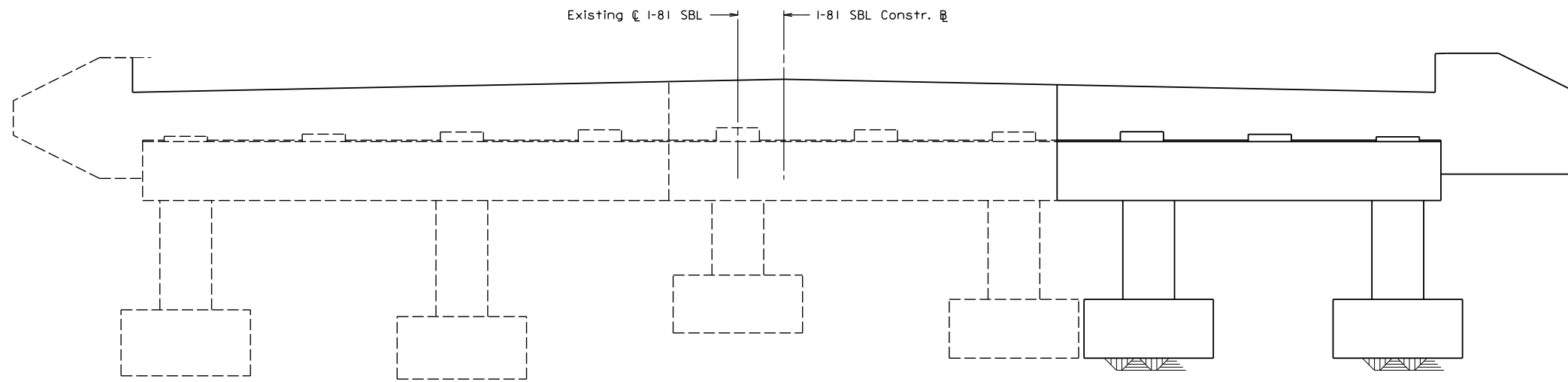
COMMONWEALTH OF VIRGINIA  
 DEPARTMENT OF TRANSPORTATION  
 PROPOSED BRIDGE REPAIRS AND WIDENING  
 I-81 SBL OVER AUGUSTA WOODS DRIVE  
 AND BUCKINGHAM BRANCH RAILROAD  
 AUGUSTA COUNTY - 0.6 MI. N. OF  
 I-81/I-64 INTERCHANGE  
 PROJECT 0081-007-013, B639

Recommended for Approval: \_\_\_\_\_ Date \_\_\_\_\_  
 District Project Development Engineer

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
 District Administrator

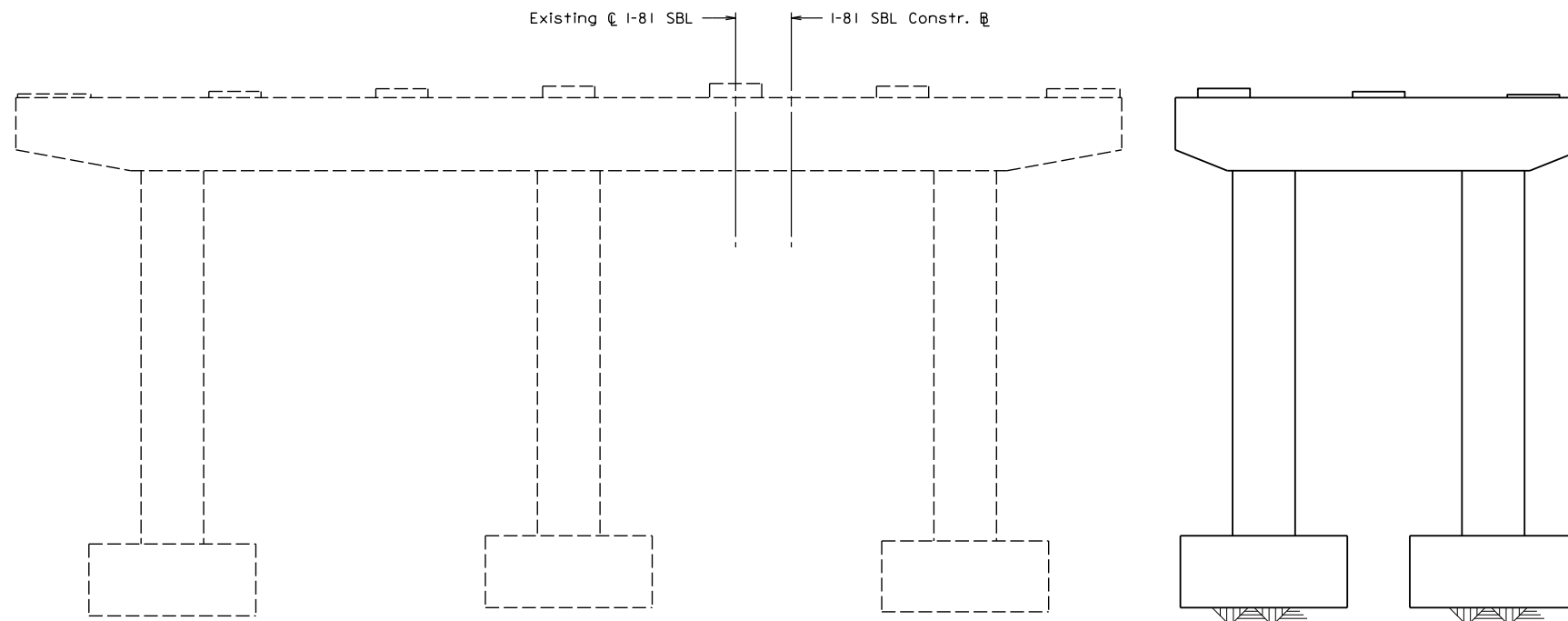
193-07B

STATE	FEDERAL AID		STATE		SHEET
VA.	ROUTE	PROJECT	ROUTE	PROJECT	NO.
	—		81	0081-007-013, B639	5



**ABUTMENT B ELEVATION**

Abutment B shown.  
 Abutment A will be extended similar to Abutment B except footing will be in-kind to existing footing and be pile supported.  
 Limits of demolition/removal are not shown.



**PIER 1 ELEVATION**

Pier 2 similar with Pier Protection

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 RICHMOND, VA  
 STRUCTURAL ENGINEER



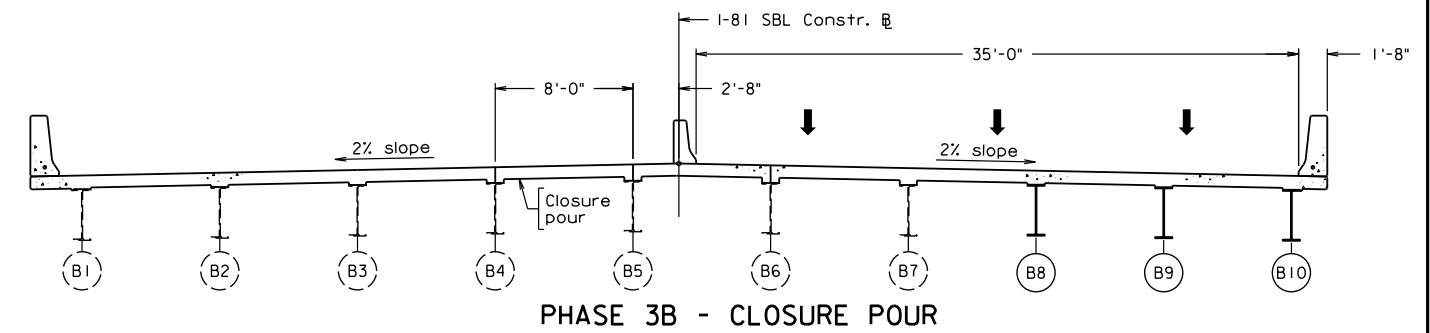
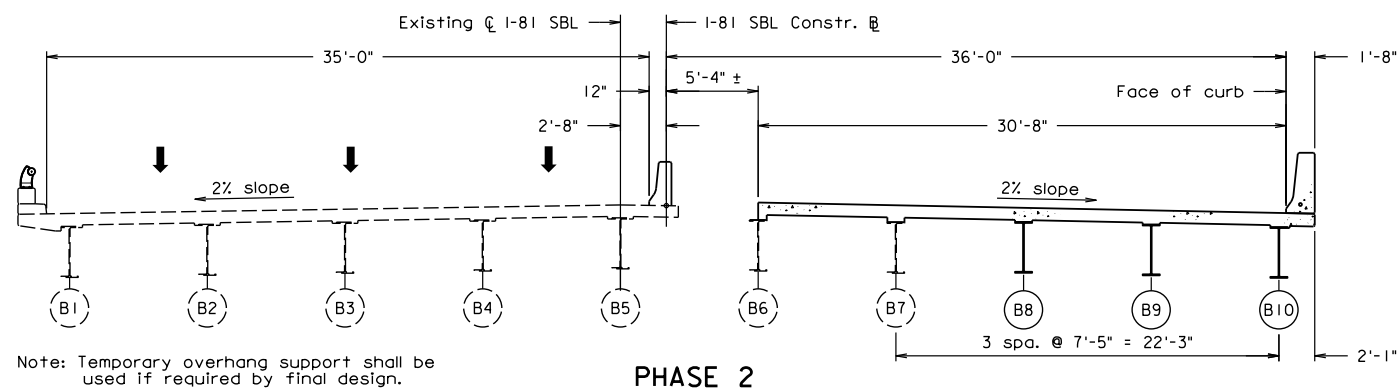
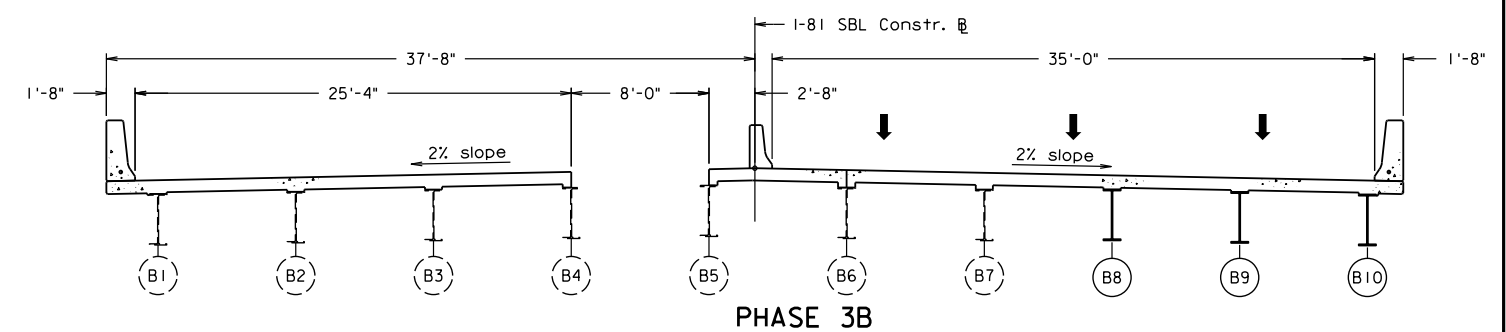
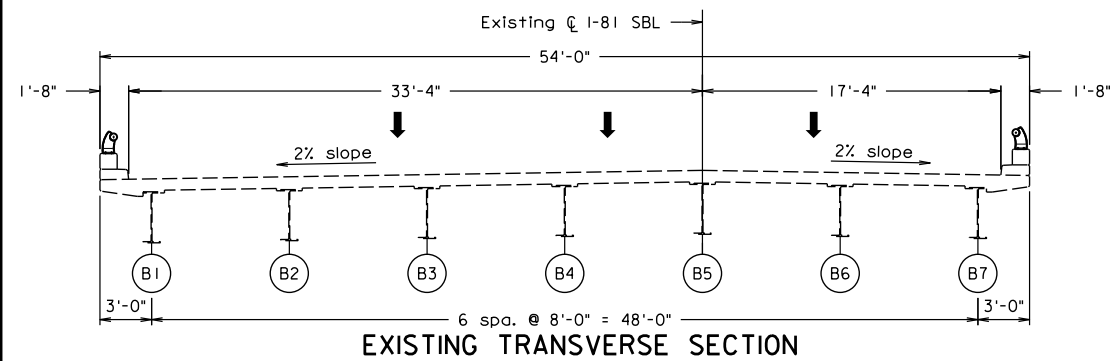
Scale: 1/4" = 1'-0" unless otherwise noted.

**PRELIMINARY PLANS**  
 THESE PLANS NOT TO BE USED  
 FOR CONSTRUCTION

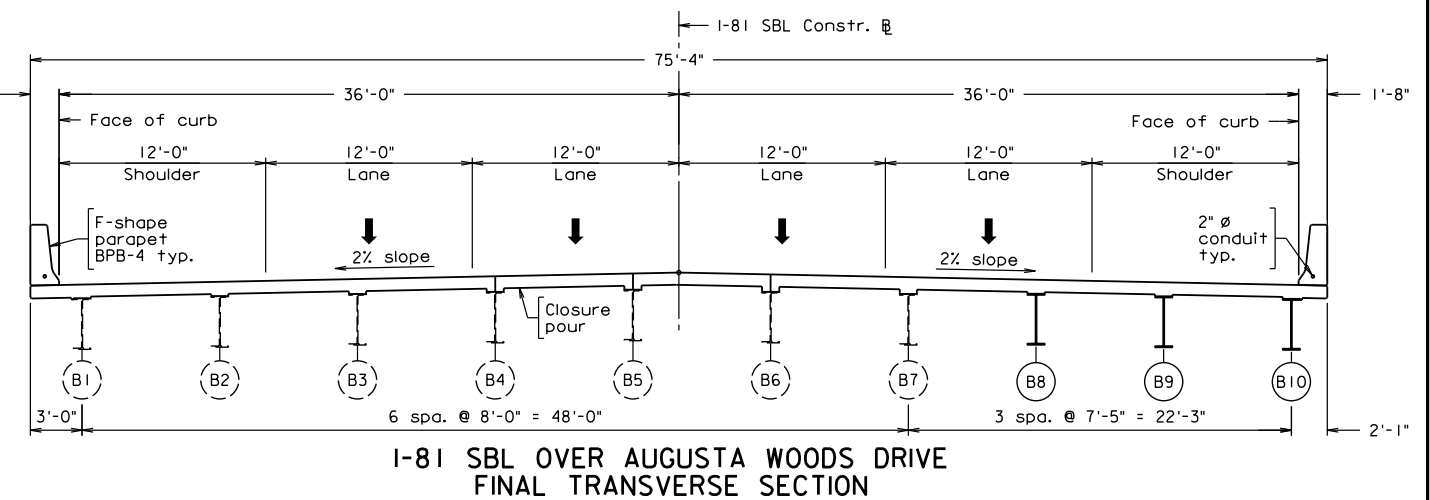
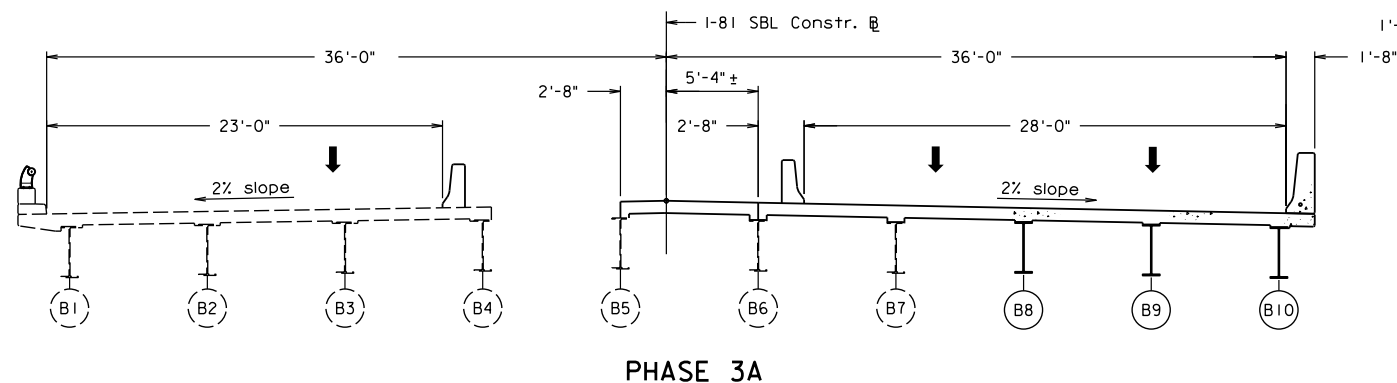
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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
<b>GENERAL SUBSTRUCTURE MODIFICATIONS FOR WIDENING</b>				
No.	Description	Date	Designed: WRA..... Drawn: WRA..... Checked: WRA.....	Date Jan. 2023
Revisions			Plan No. 193-07B	Sheet No. 5 of 15

STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT		ROUTE	NO.
VA.			81	6
			0081-007-013, B639	



Note: Temporary overhang support shall be used if required by final design.



WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER

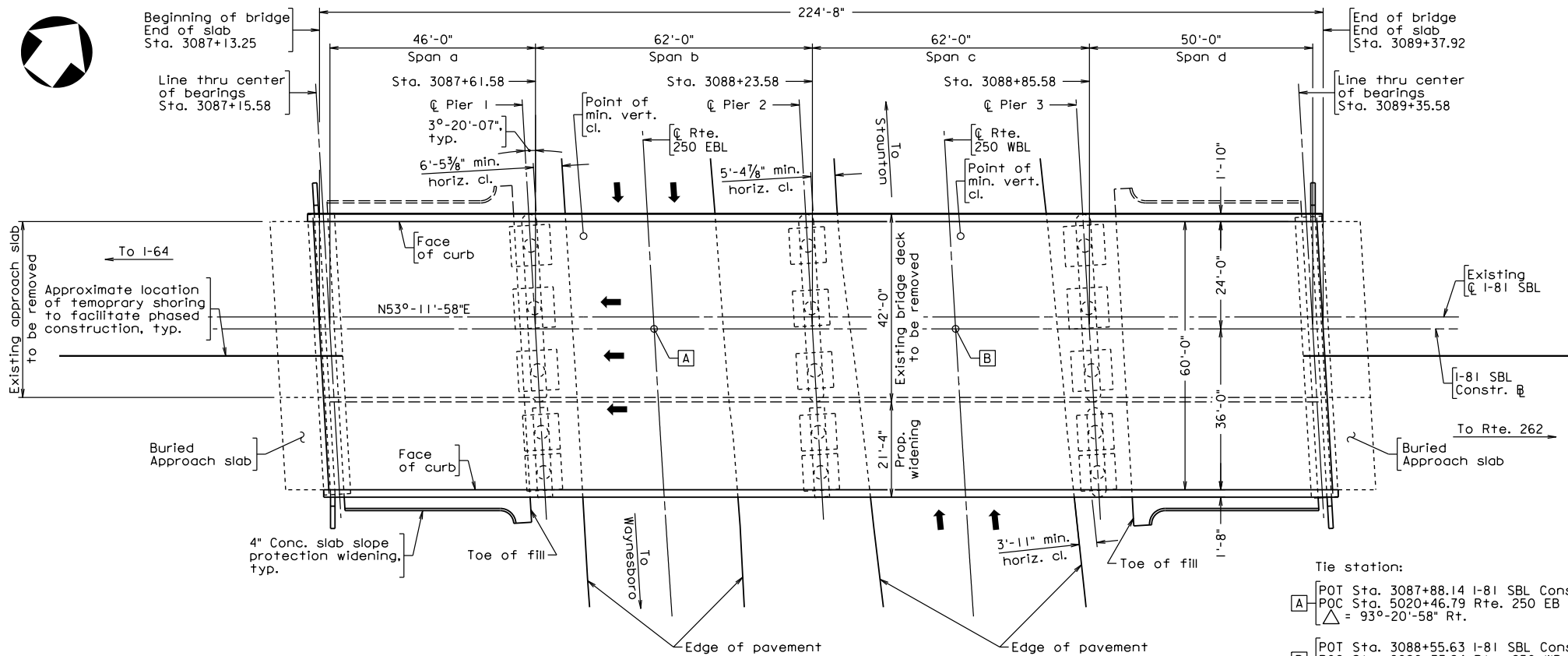


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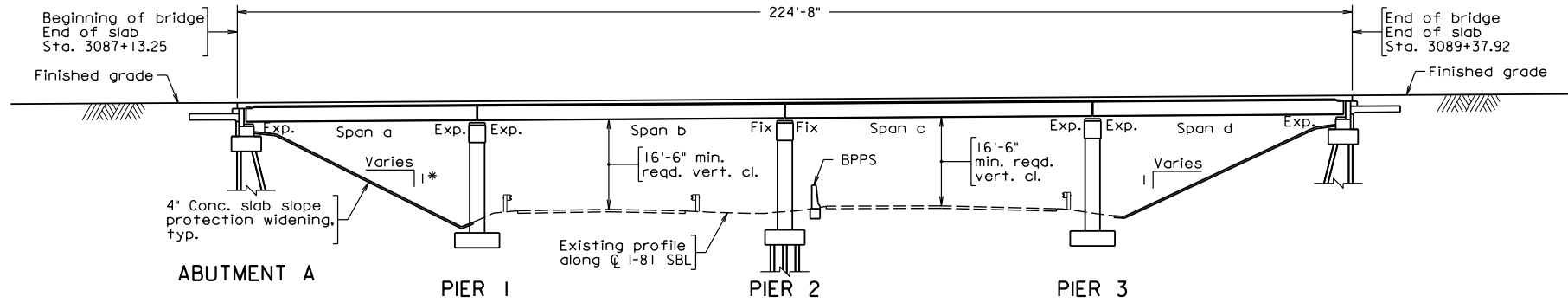
PRELIMINARY PLANS  
THESE PLANS NOT TO BE USED  
FOR CONSTRUCTION

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
SEQUENCE OF CONSTRUCTION			
No.	Description	Date	Designed: WRA Drawn: WRA Checked: WRA
	Revisions		Date: Jan. 2023
			Plan No. 193-07B
			Sheet No. 6 of 15

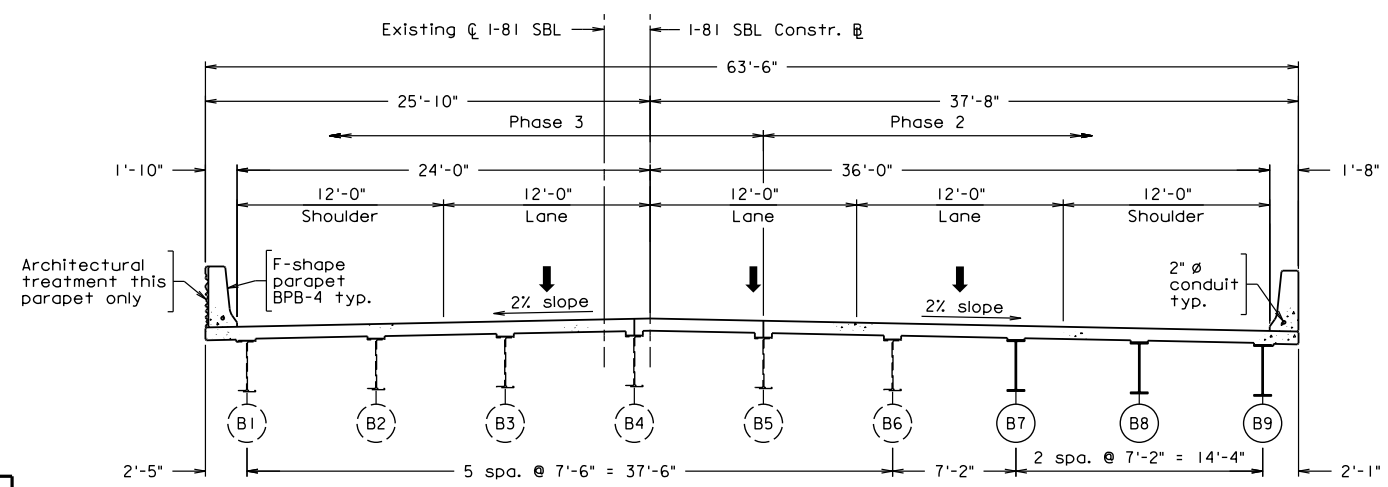


PLAN



DEVELOPED SECTION ALONG CONSTR.

\*Normal to Abutment



TRANSVERSE SECTION

Scale: 3/16" = 1'-0"

Scale: 1/16" = 1'-0" unless otherwise noted.

STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT
VA.	NHPP-081-2(329)	81	0081-007-013, B640
Federal Structure No.	00000000001812	FHWA Construction and Scour Code:	X271-SN
Federal Stewardship and Oversight Code:	F0	UPC No.	116269

DESIGN EXCEPTION(S):

EXISTING STRUCTURE GENERAL NOTES:

Capacity: HS-20-44 loading and Bureau of Public Roads modified loading for military vehicles.  
 Specifications:  
 General: Virginia Department of Highways Road and Bridge Specifications, 1958.  
 Design: AASHTO Standard Specifications for Highway Bridges, 1961.

PROPOSED STRUCTURE GENERAL NOTES:

The original approved sheet, including original signatures, is filed in the VDOT Central Office. Any misuse of electronic files, including scanned signatures, is illegal. Violators will be prosecuted to the full extent of the applicable laws.  
 Width: 60'-0" face-to-face of curbs.  
 Span layout: 46'-0" - 62'-0" - 62'-0" - 50'-0" steel beams.  
 Capacity: HL-93 loading.  
 Specifications:  
 Construction: Virginia Department of Transportation Road and Bridge Specifications, 2020.  
 Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; 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.  
 Virginia Structure No. of existing bridge is 2047. Plan No. 193-08 and 193-08A  
 The existing structure is designated a Type B structure in accordance with Sec. 411.



COMMONWEALTH OF VIRGINIA  
 DEPARTMENT OF TRANSPORTATION  
 PROPOSED BRIDGE REPAIRS AND WIDENING  
 I-81 SBL OVER RTE. 250  
 AUGUSTA COUNTY - AT 0.8 MI. N. OF  
 I-81/I-64 INTERCHANGE  
 PROJECT 0081-007-013, B640

PRELIMINARY PLANS  
 THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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

Recommended for Approval: \_\_\_\_\_ Date \_\_\_\_\_  
 District Project Development Engineer

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
 District Administrator

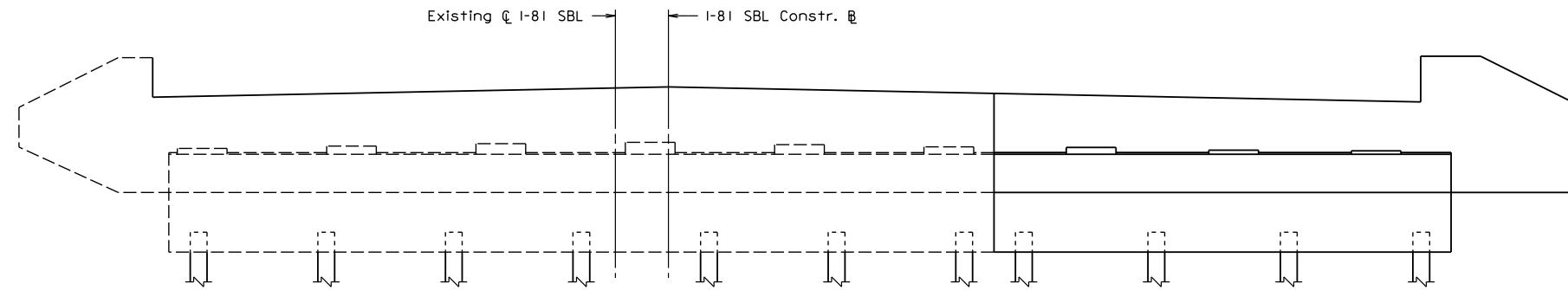
193-08B

Date: \_\_\_\_\_ © 2023, Commonwealth of Virginia Sheet 7 of 15

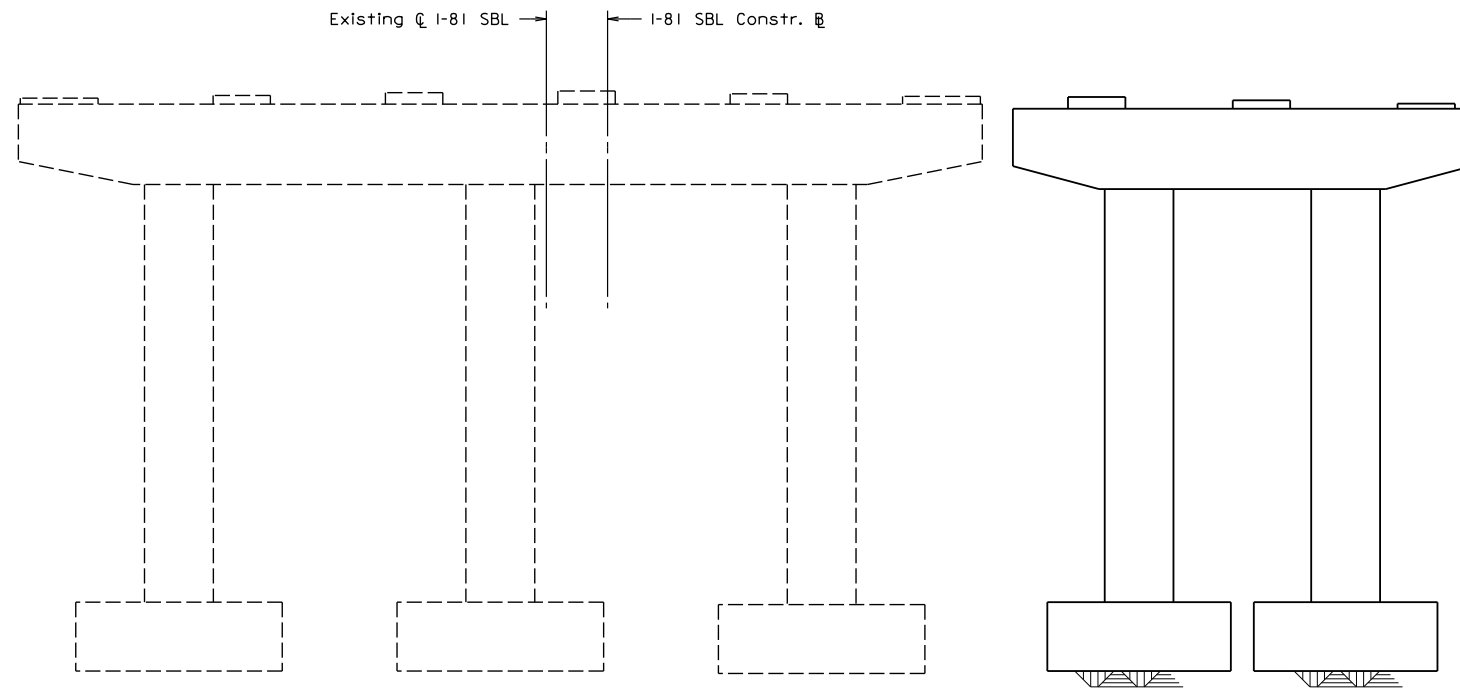
WHITMAN REQUARDT & ASSOCIATES  
 RICHMOND, VA  
 STRUCTURAL ENGINEER  
 PLANS BY: Whitman Requardt and Assoc.  
 COORDINATED:  
 SUPERVISED:  
 DESIGNED:  
 DRAWN:  
 CHECKED:



STATE	FEDERAL AID		STATE		SHEET NO.
VA.	ROUTE	PROJECT	ROUTE	PROJECT	8
			81	0081-007-013, B640	



**ABUTMENT B ELEVATION**  
Abutment A similar opposite hand.  
Limits of demolition/removal are not shown.



**PIER 1 ELEVATION**  
Pier 2 and 3 similar. Pier 2 with pile supported footings.

**PRELIMINARY PLANS**  
**THESE PLANS NOT TO BE USED FOR CONSTRUCTION**

Scale: 1/4" = 1'-0" unless otherwise noted.

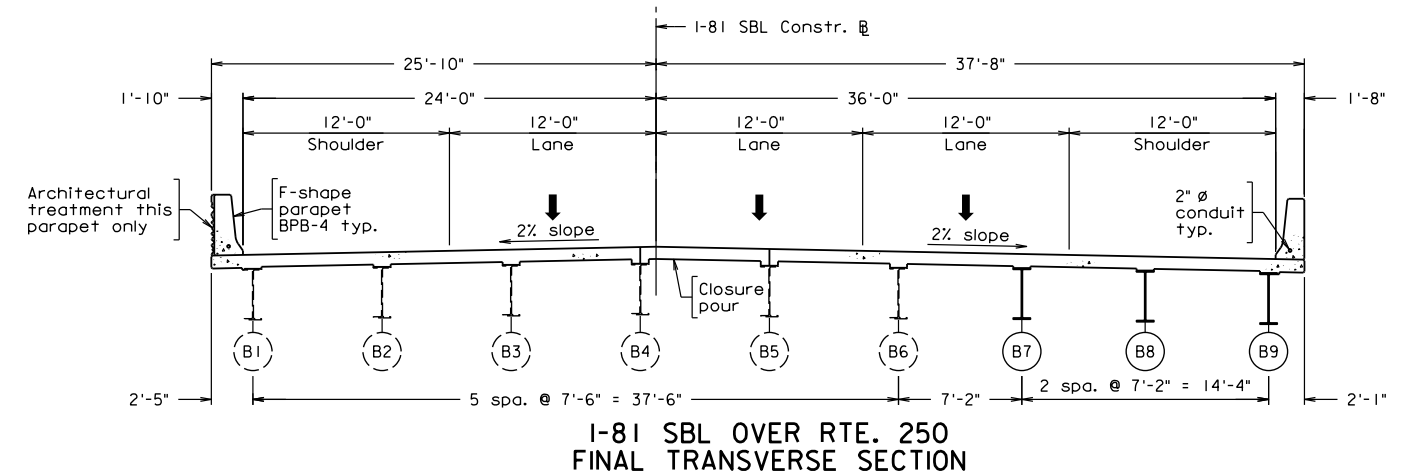
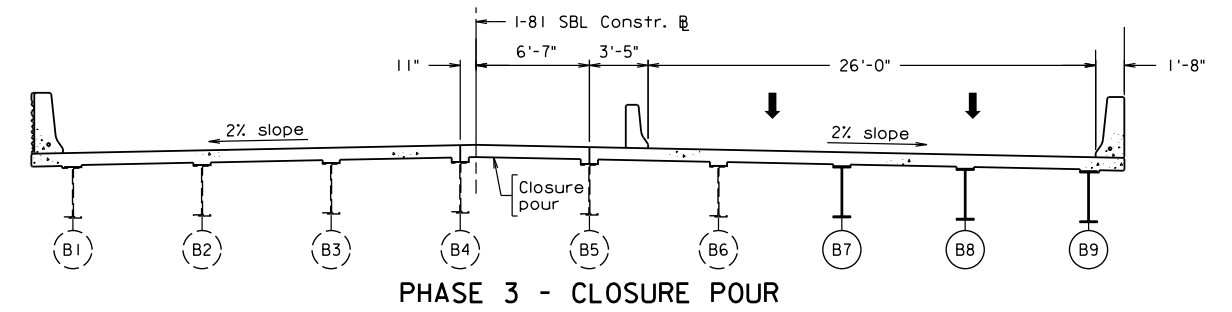
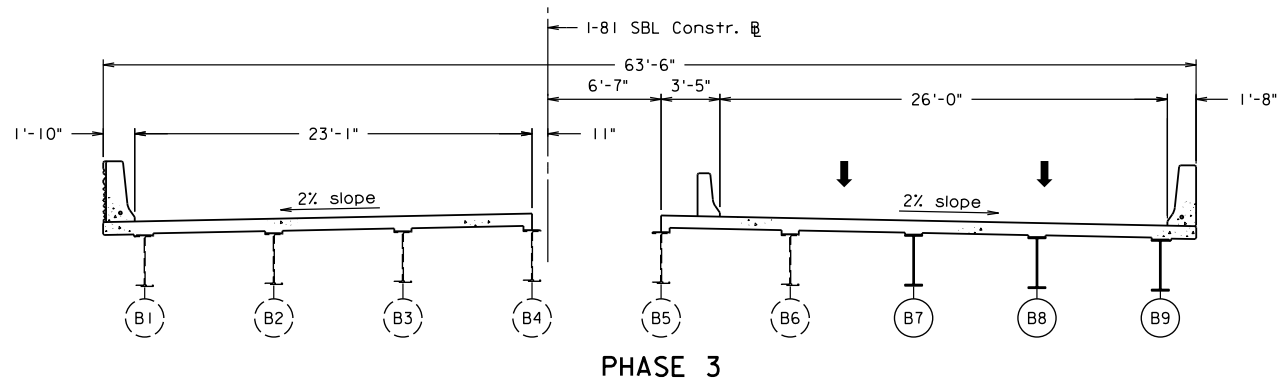
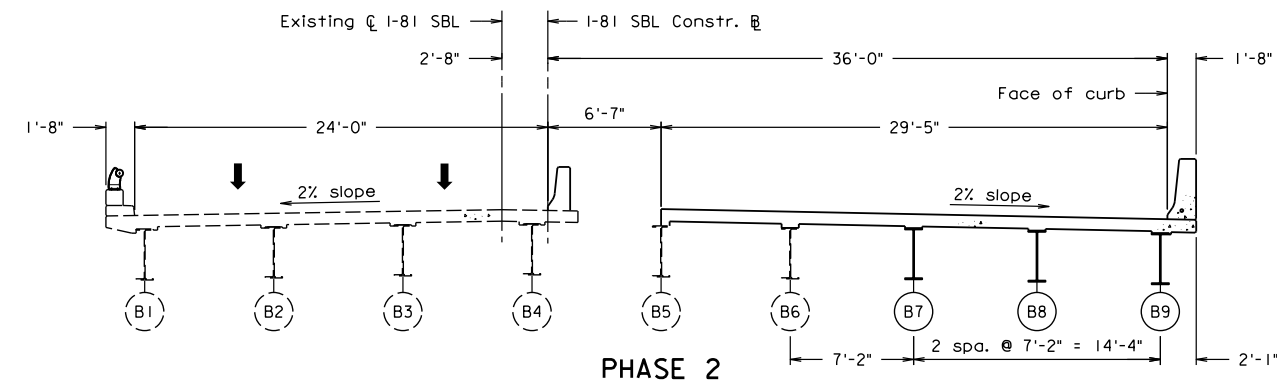
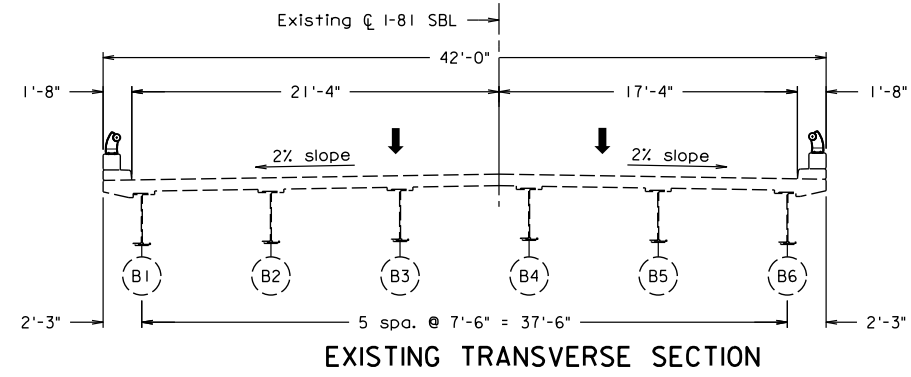
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COMMONWEALTH OF VIRGINIA				
DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
<b>GENERAL SUBSTRUCTURE MODIFICATIONS FOR WIDENING</b>				
No.	Description	Date	Designed: WRA.....	Sheet No.
Revisions		Checked: WRA.....	Date: Jan. 2023	Plan No. 193-08B
				8 of 15

WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER



STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT		ROUTE	NO.
VA.			81	9
			0081-007-013, B640	



WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER

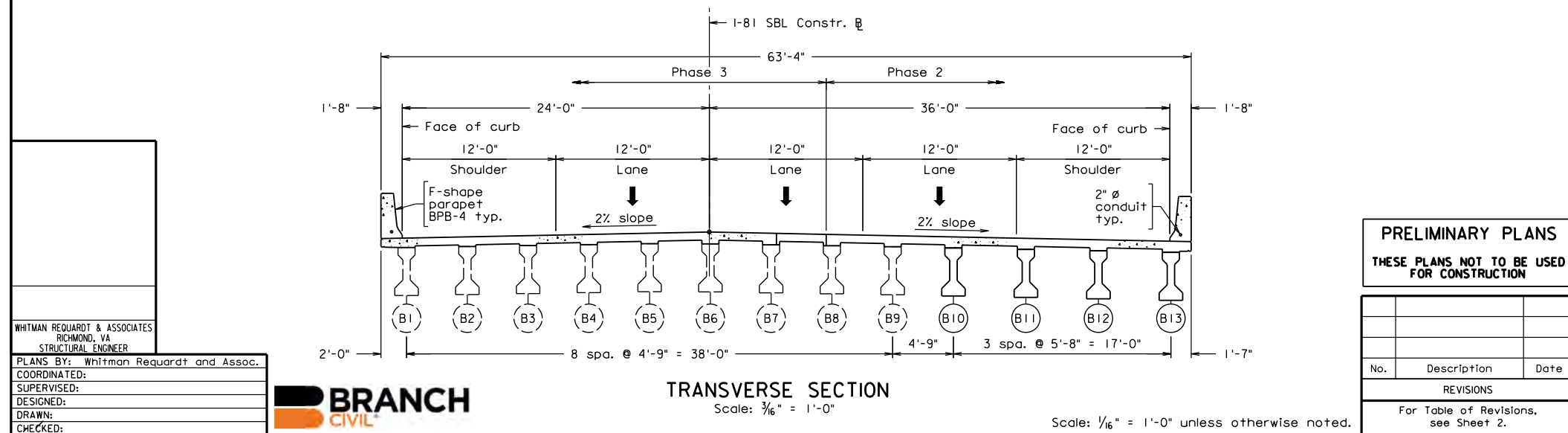
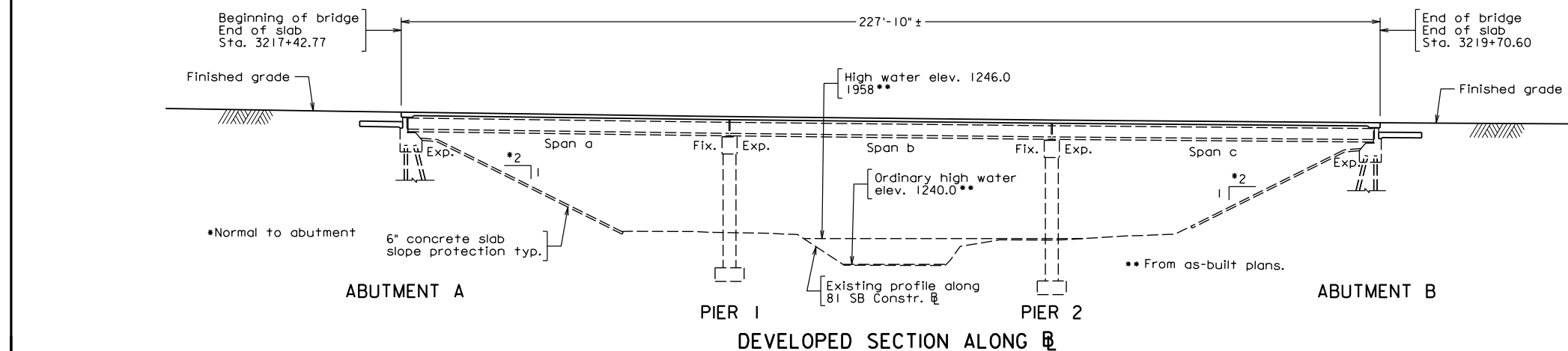
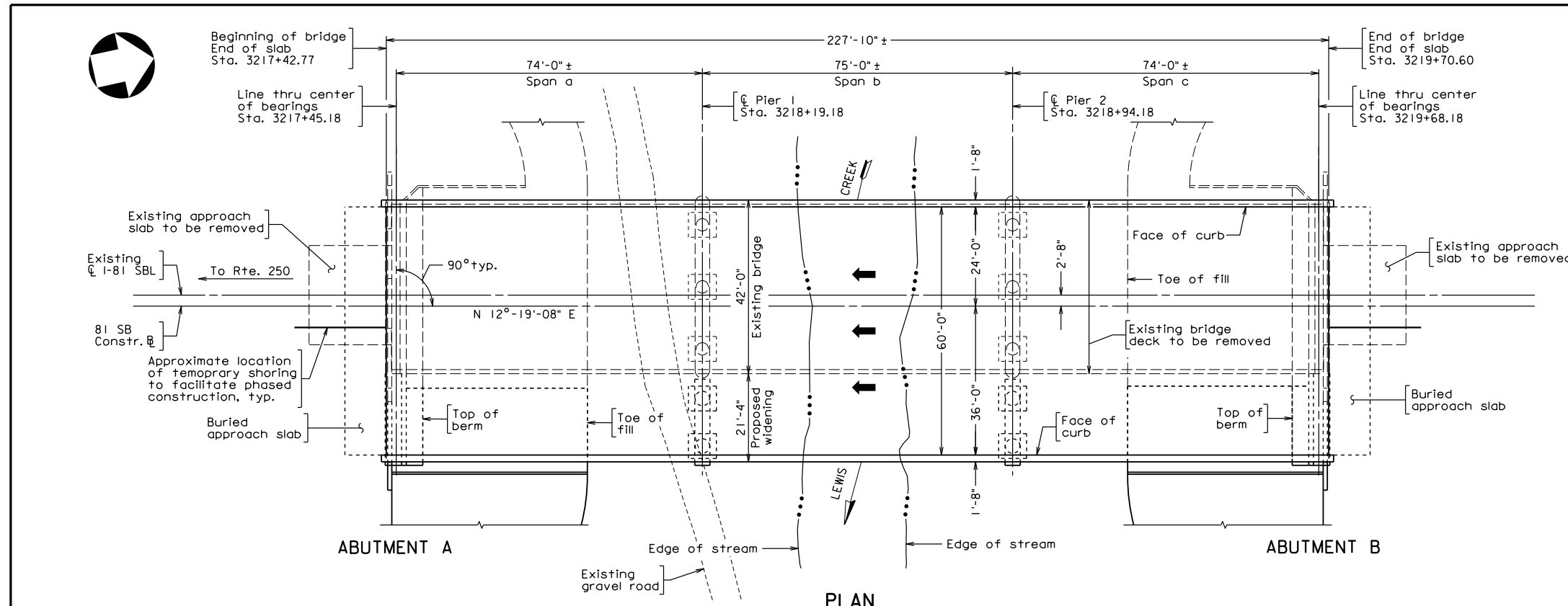


Scale:  $\frac{3}{16}" = 1'-0"$

**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
<b>SEQUENCE OF CONSTRUCTION</b>			
No.	Description	Date	Revisions
Designed: WRA	Date	Plan No.	Sheet No.
Drawn: WRA	Jan. 2023	193-08B	9 of 15
Checked: WRA			



WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER

PLANS BY: Whitman Requardt and Assoc.  
COORDINATED:  
SUPERVISED:  
DESIGNED:  
DRAWN:  
CHECKED:



STATE	FEDERAL AID	STATE	SHEET NO.
VA.	NHPP-081-2(329)	81	0081-007-013, B641
Federal Structure No. 00000000001853		FHWA Construction and Scour Code: X081-S5	
Federal Stewardship and Oversight Code: F0		UPC No. 116269	

**DESIGN EXCEPTION(S):**

**EXISTING STRUCTURE GENERAL NOTES:**

Capacity: HS-20-44 loading and Bureau of Public Roads modified loading for military vehicles.

Specifications:

General: Virginia Department of Highways Road and Bridge Specifications, 1958.

Design: AASHTO Standard Specifications for Highway Bridges, 1961.

**PROPOSED STRUCTURE GENERAL NOTES:**

The original approved sheet, including original signatures, is filed in the VDOT Central Office. Any misuse of electronic files, including scanned signatures, is illegal. Violators will be prosecuted to the full extent of the applicable laws.

Width: 60'-0" face-to-face of curbs.

Span layout: 74'-0" - 75'-0" - 74'-0" prestressed concrete 45" deep I-beam spans.

Capacity: HL-93 loading.

Drainage area: 20.0 sq. mi.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2020.

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; 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.

Virginia Structure No. of existing bridge is 007-2106. Plan No. is 200-23.

**VDOT**

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION  
PROPOSED BRIDGE ON

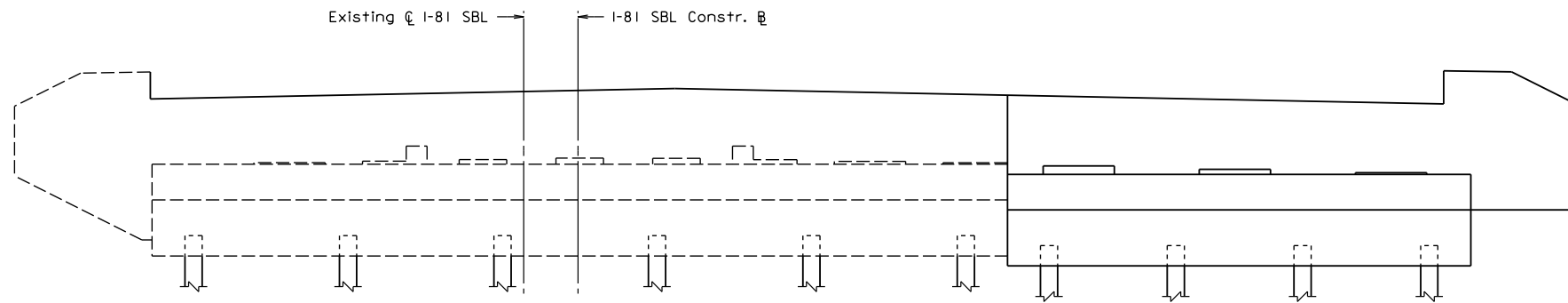
I-81 SBL OVER LEWIS CREEK  
AUGUSTA CO. - 0.61 MI. S. OF RTE. 262  
PROJ. 0081-007-013, B641

Recommended for Approval: \_\_\_\_\_ Date \_\_\_\_\_  
District Project Development Engineer

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
District Administrator

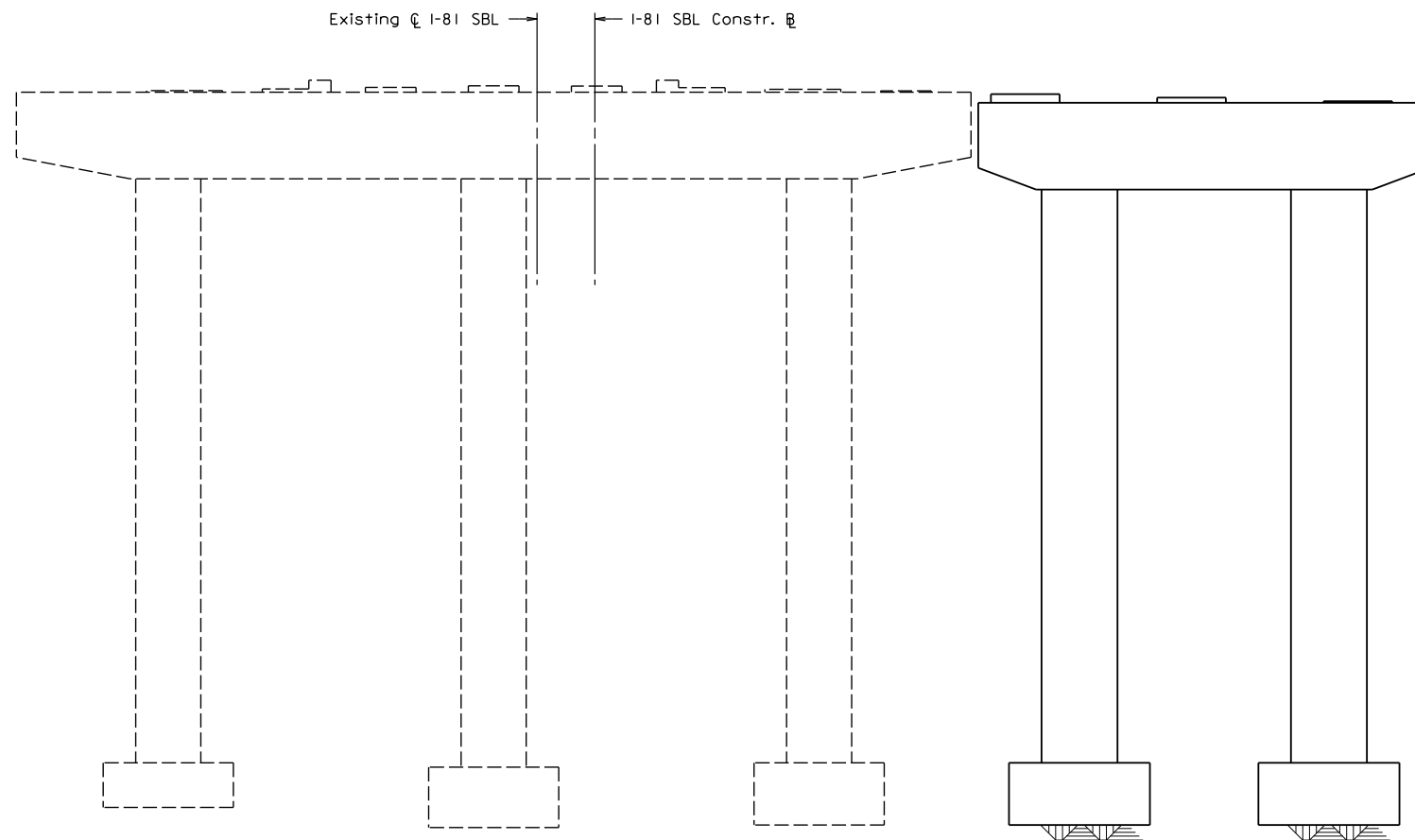
Date: \_\_\_\_\_ © 2023, Commonwealth of Virginia Sheet 10 of 15

STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.	—		81	0081-007-013, B641	11



**ABUTMENT B ELEVATION**

Abutment A similar opposite hand.  
Limits of demolition/removal are not shown.



**TYPICAL PIER ELEVATION**

Pier 1 shown, Pier 2 similar

Scale: 1/4" = 1'-0" unless otherwise noted.

**PRELIMINARY PLANS**  
**THESE PLANS NOT TO BE USED FOR CONSTRUCTION**

COMMONWEALTH OF VIRGINIA					
DEPARTMENT OF TRANSPORTATION					
STRUCTURE AND BRIDGE DIVISION					
<b>GENERAL SUBSTRUCTURE MODIFICATIONS FOR WIDENING</b>					
No.	Description	Date	Designed: WRA.....	Date	Plan No.
			Drawn: WRA.....	Jan. 2023	200-23B
			Checked: WRA.....		11 of 15
Revisions					

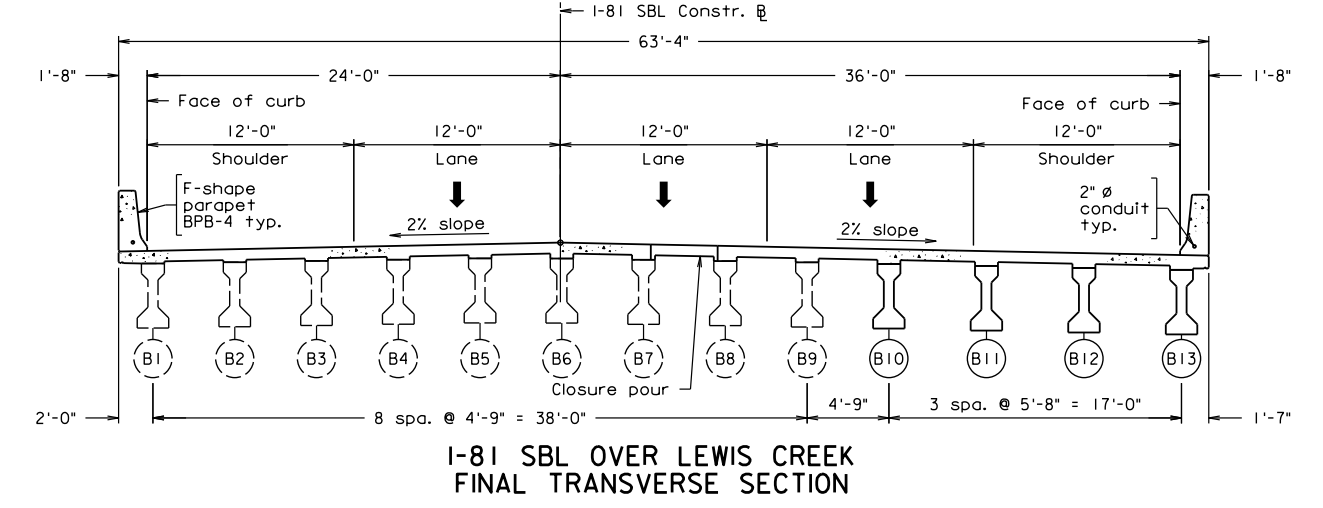
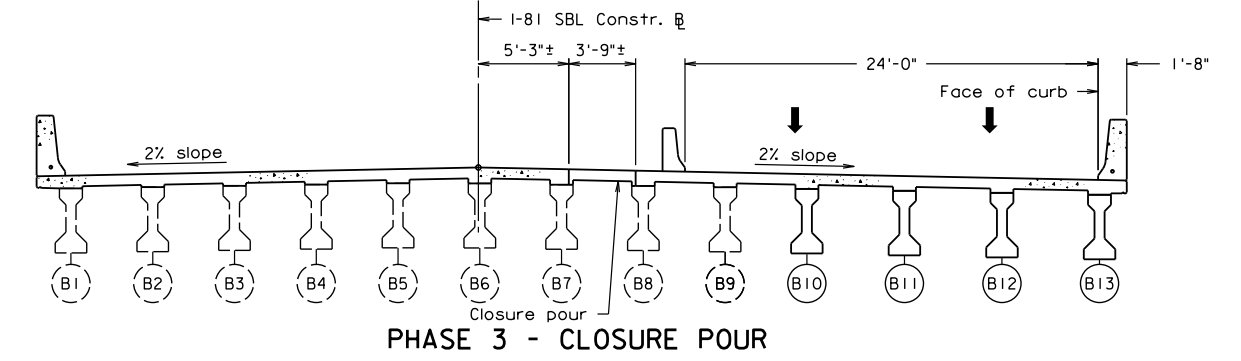
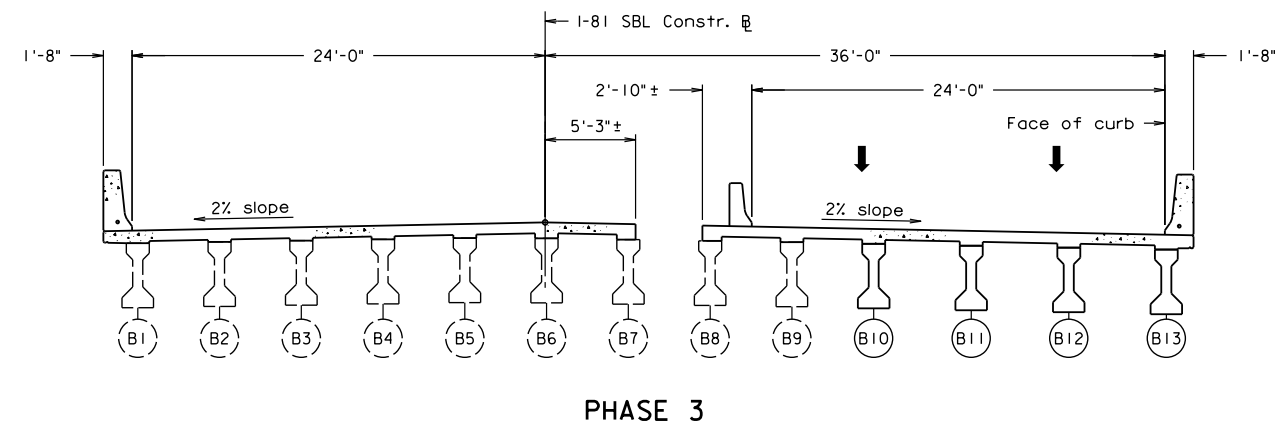
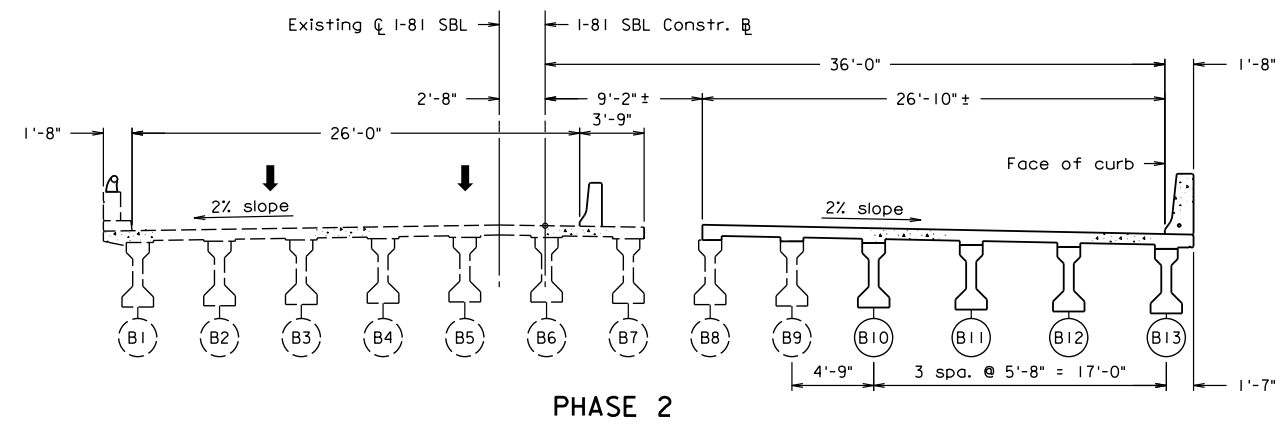
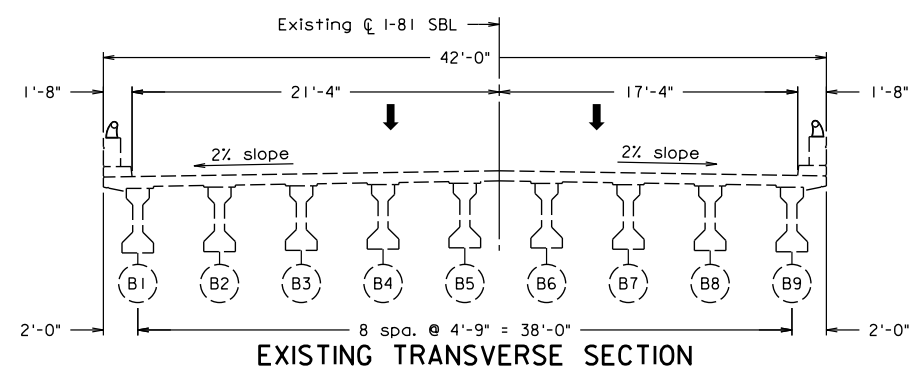
WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER



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STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT		ROUTE	PROJECT
VA.			81	0081-007-013, B641
				12



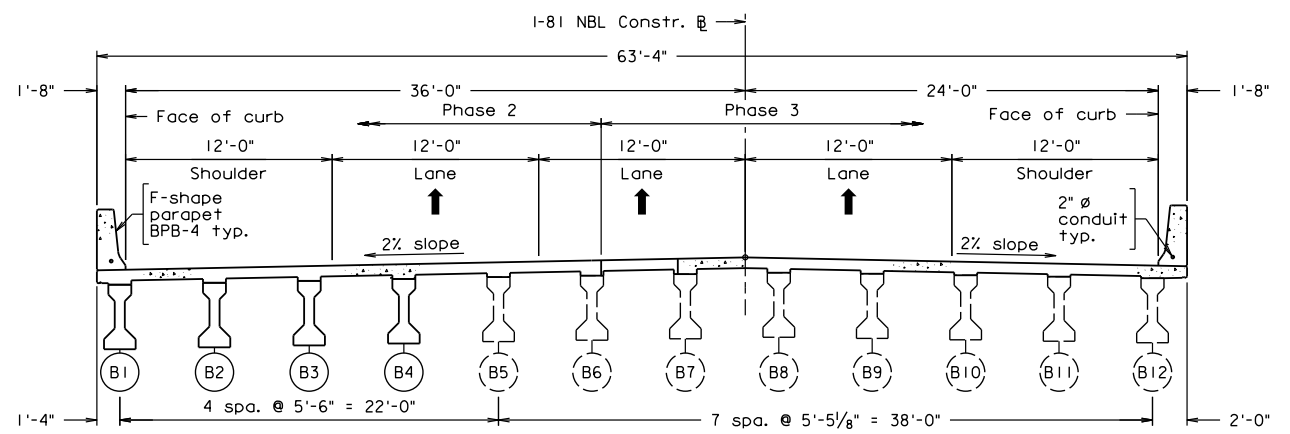
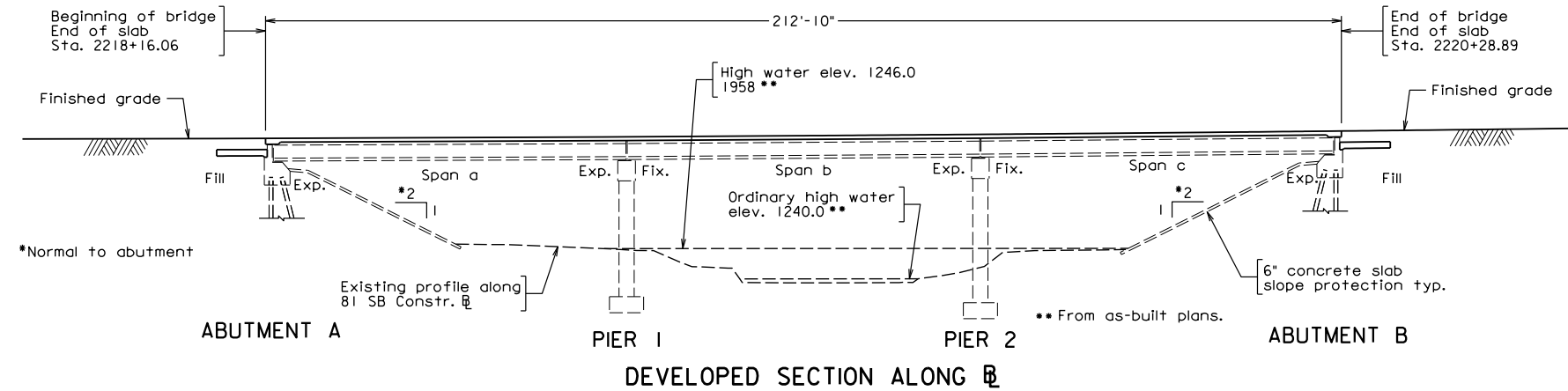
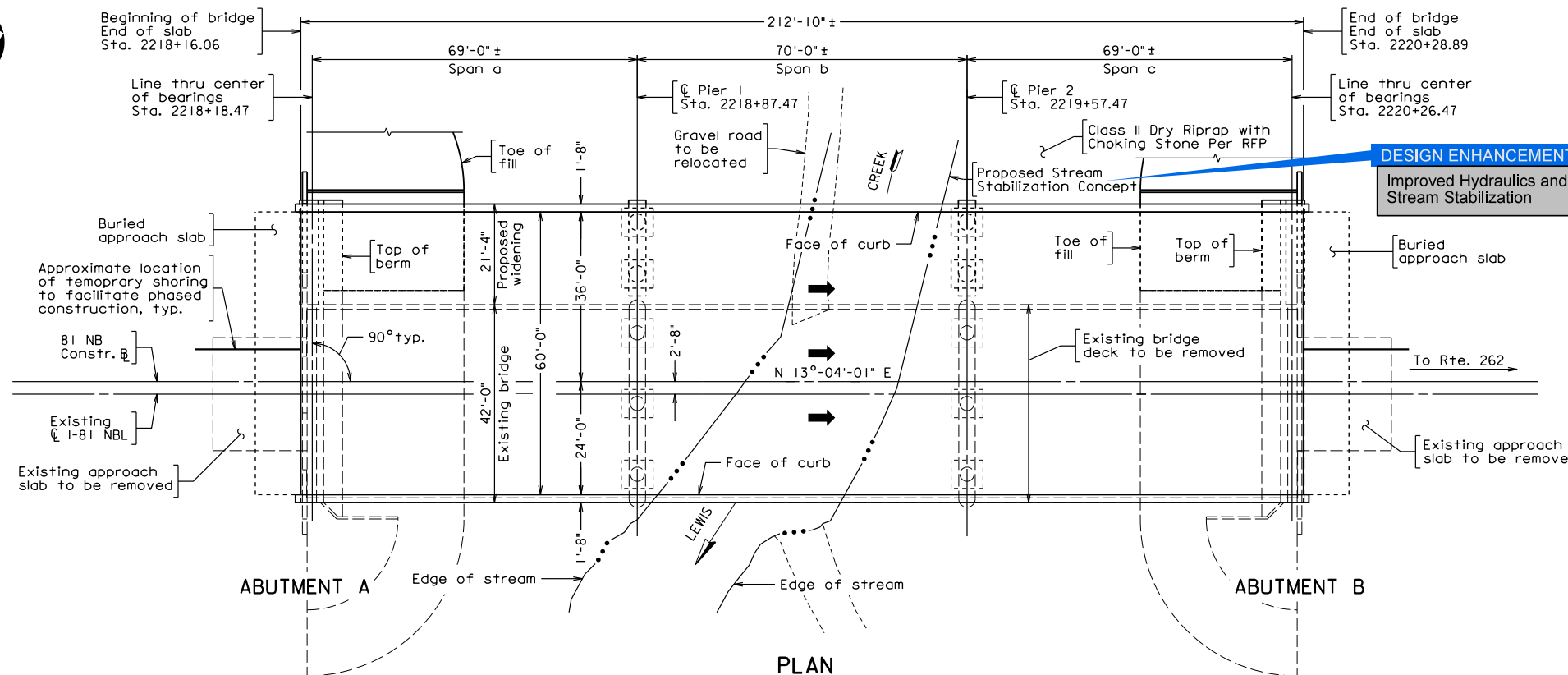
WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER



Scale: 3/16" = 1'-0"

**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED  
FOR CONSTRUCTION

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
<b>SEQUENCE OF CONSTRUCTION</b>			
No.	Description	Date	Designed: WRA Drawn: WRA Checked: WRA
	Revisions		Date: Jan. 2023
			Plan No. 200-23B
			Sheet No. 12 of 15



TRANSVERSE SECTION  
Scale: 1/16" = 1'-0"

Scale: 1/16" = 1'-0" unless otherwise noted.

STATE	FEDERAL AID		STATE		SHEET
VA.	ROUTE	PROJECT	ROUTE	PROJECT	NO.
		NHPP-081-2(329)	81	0081-007-013, B642	13
Federal Structure No. 00000000001854			FHWA Construction and Scour Code: X081-S5		
Federal Stewardship and Oversight Code:				UPC No. 116269	

DESIGN EXCEPTION(S):

EXISTING STRUCTURE GENERAL NOTES:

Capacity: HS-20-44 loading and Bureau of Public Roads modified loading for military vehicles.  
Specifications:  
General: Virginia Department of Highways Road and Bridge Specifications, 1958.  
Design: AASHTO Standard Specifications for Highway Bridges, 1961.

PROPOSED STRUCTURE GENERAL NOTES:

The original approved sheet, including original signatures, is filed in the VDOT Central Office. Any misuse of electronic files, including scanned signatures, is illegal. Violators will be prosecuted to the full extent of the applicable laws.  
Width: 60'-0" face-to-face of curbs.  
Span layout: 69'-0" - 70'-0" - 69'-0" prestressed concrete 45" deep I-beam spans.  
Capacity: HL-93 loading.  
Drainage area: 20.0 sq. mi.  
Specifications:  
Construction: Virginia Department of Transportation Road and Bridge Specifications, 2020.  
Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; 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.  
Virginia Structure No. of existing bridge is 007-2107. Plan No. is 200-23.



COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION  
PROPOSED BRIDGE WIDENING ON  
I-81 NBL OVER LEWIS CREEK  
AUGUSTA CO. - 0.61 MI. S. OF RTE. 262  
PROJ. 0081-007-013, B642

PRELIMINARY PLANS  
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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

Recommended for Approval: \_\_\_\_\_ Date \_\_\_\_\_  
District Project Development Engineer

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
District Administrator

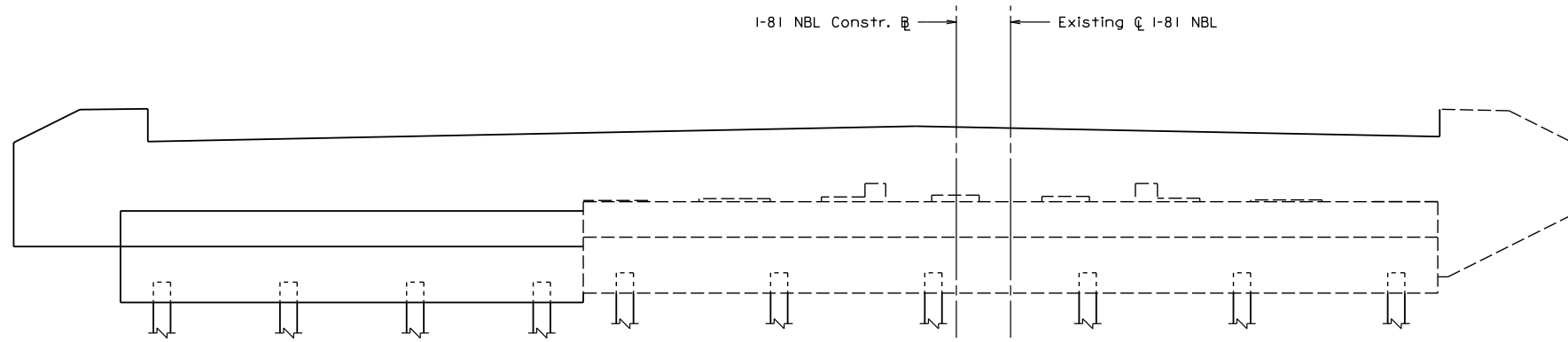
Date: \_\_\_\_\_ © 2023, Commonwealth of Virginia Sheet 13 of 15

WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER  
PLANS BY: Whitman Requardt and Assoc.  
COORDINATED:  
SUPERVISED:  
DESIGNED:  
DRAWN:  
CHECKED:



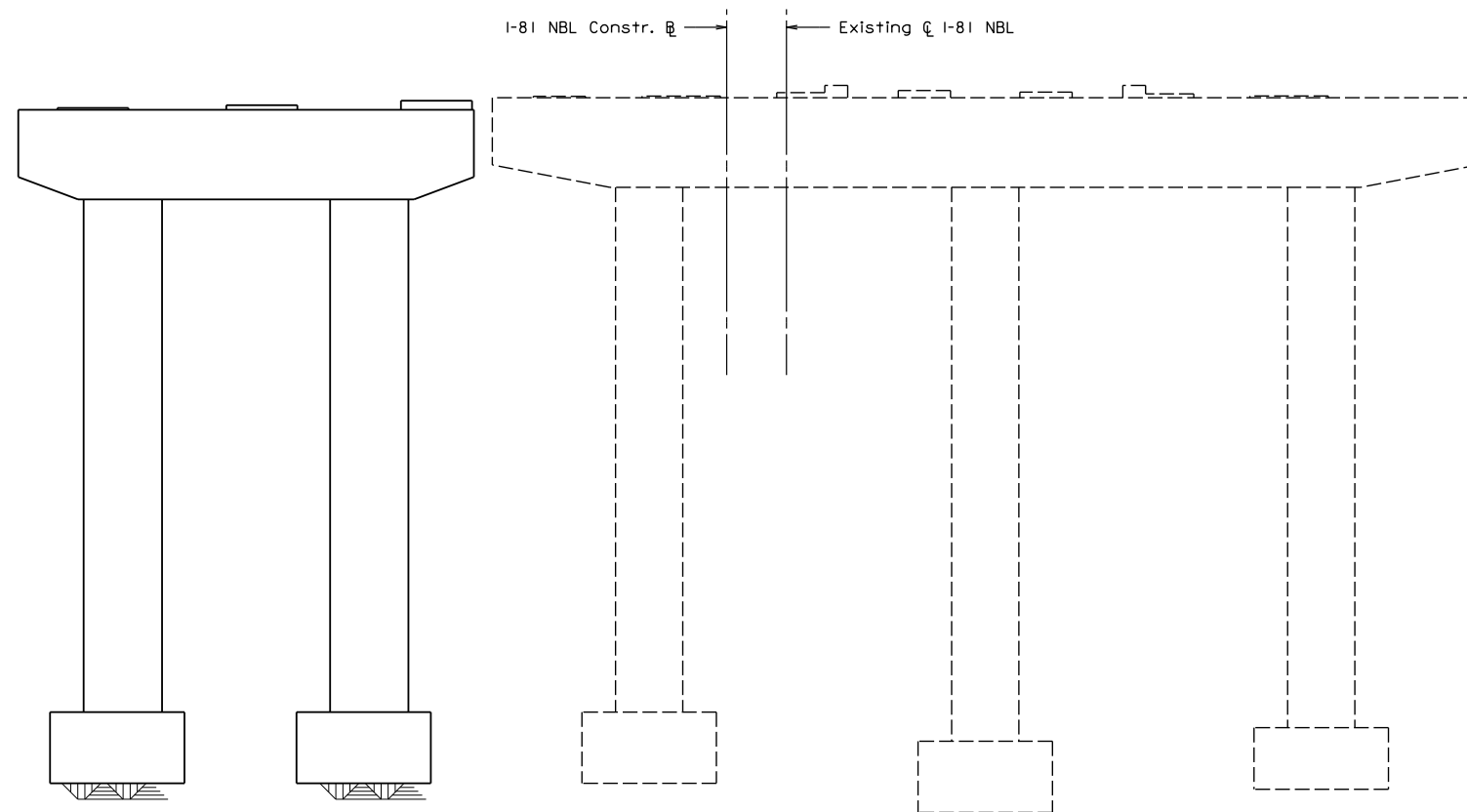
200-23A

STATE	FEDERAL AID		STATE	SHEET
VA.	ROUTE	PROJECT	ROUTE	NO.
	—		81	14
			0081-007-013, B642	



**ABUTMENT B ELEVATION**

Abutment A similar opposite hand.  
Limits of demolition/removal are not shown.



**TYPICAL PIER ELEVATION**

Pier 1 shown, Pier 2 similar

WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER



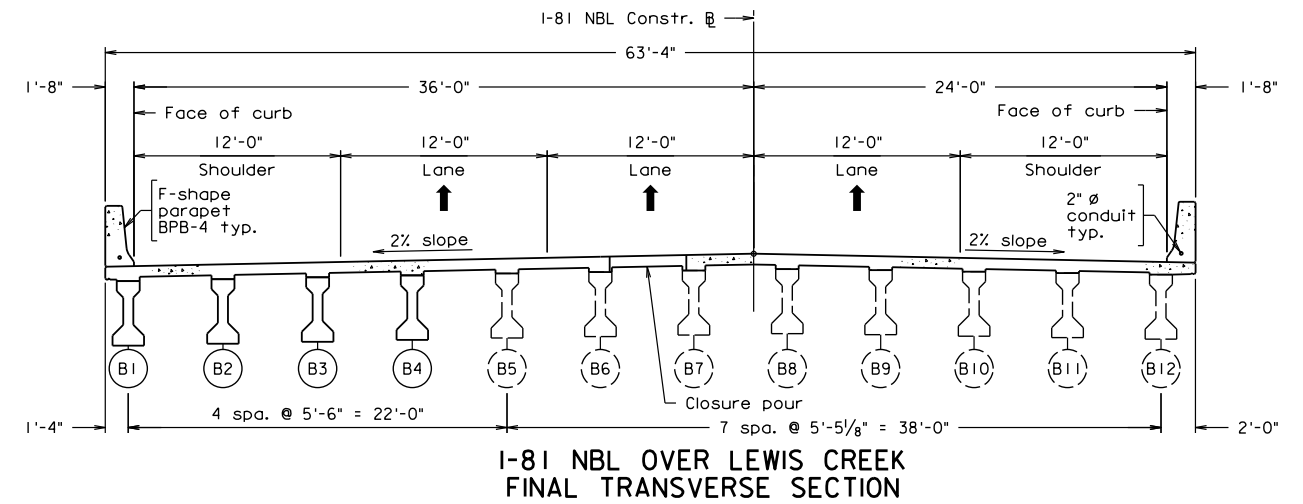
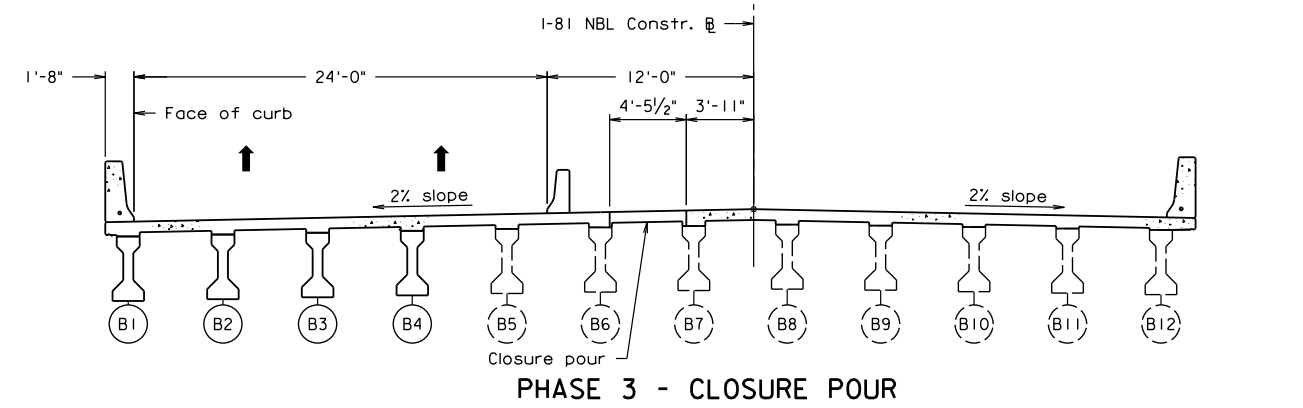
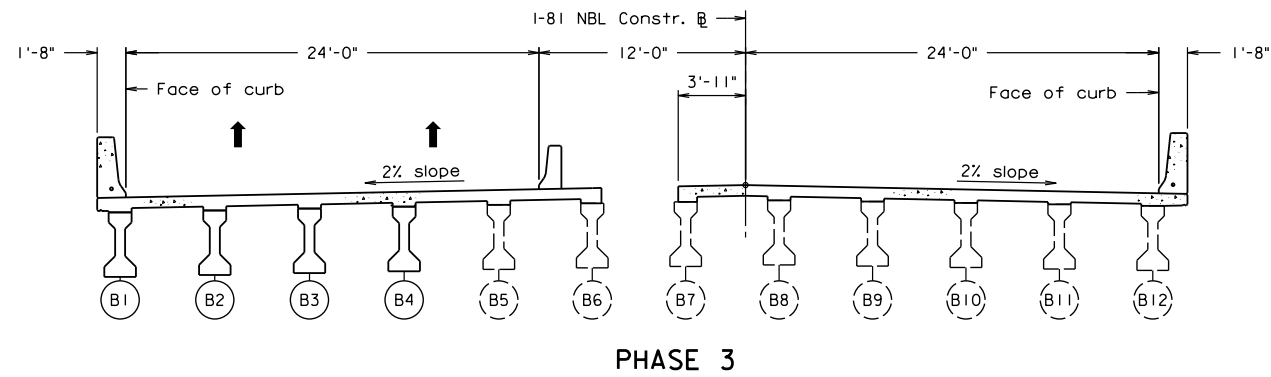
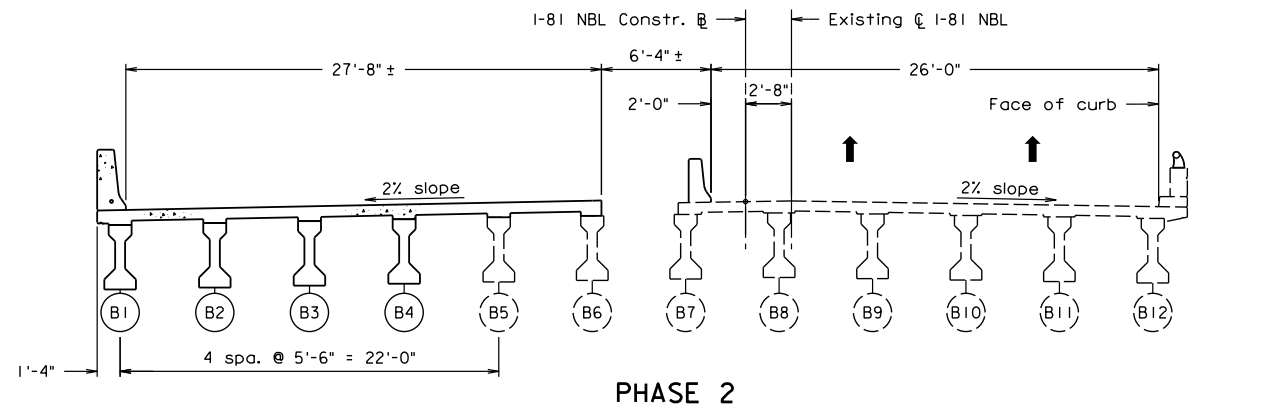
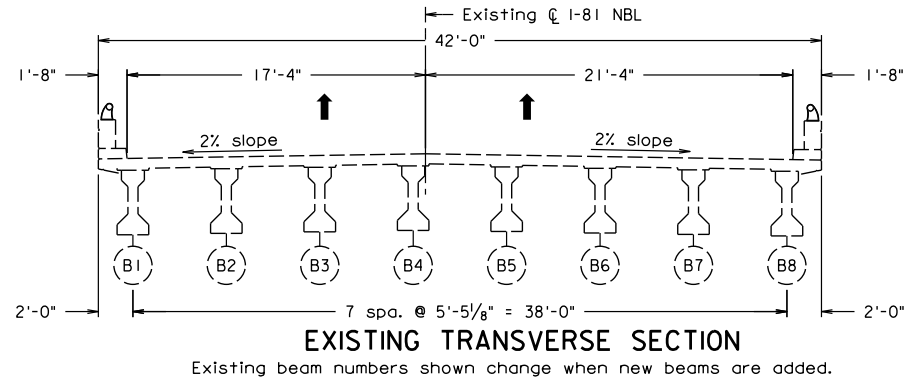
Scale: 1/4" = 1'-0" unless otherwise noted.

**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED  
FOR CONSTRUCTION

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
<b>GENERAL SUBSTRUCTURE MODIFICATIONS FOR WIDENING</b>			
No.	Description	Date	Revisions
Designed: WRA	Date	Plan No.	Sheet No.
Drawn: WRA	Jan. 2023	200-23A	14 of 15
Checked: WRA			

STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT		ROUTE	NO.
VA.			81	15
			0081-007-013, B642	



WHITMAN REQUARDT & ASSOCIATES  
RICHMOND, VA  
STRUCTURAL ENGINEER



Scale: 3/16" = 1'-0"

**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED  
FOR CONSTRUCTION

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
<b>SEQUENCE OF CONSTRUCTION</b>			
No.	Description	Date	Designed: WRA Drawn: WRA Checked: WRA
	Revisions		Date: Jan. 2023
		Plan No.	Sheet No.
		200-23A	15 of 15

A dark gray background with a complex, white, topographic map pattern of contour lines. The lines are irregular and dense, creating a textured, organic appearance.

# TAB 2

Utility Matrix

### UTILITY MATRIX

#### Cost Responsibility Reason Codes

1. - 33.2-348 used on urban projects for utilities owned by a municipality, public utility district or public utility authority.; 2. - 33.2-307 (a) used on Interstate in cities or towns for utilities located in city streets.; 3. - 33.2-307 (b) used on Arterial Projects for utilities owned by a county, city, town or public utility authority located in existing streets.; 4. - 33.2-308 used on Interstate and Primary projects in counties for all utilities owned by a county or political subdivision of the state or county and for water or sanitary sewer owned by a city or town extending into any county.; 5. - 33.2-330 used on secondary projects for utilities owned by county, city, town, authority or district.; 6. - 33.1-1701 used on certain bond projects.; 7. - 33.2-1014 used for utilities located on private property.; 8. - Prior Rights.; 9. - Prior Agreements (provide date).; 10 - (other) was just part of a recent VDOT relocation.

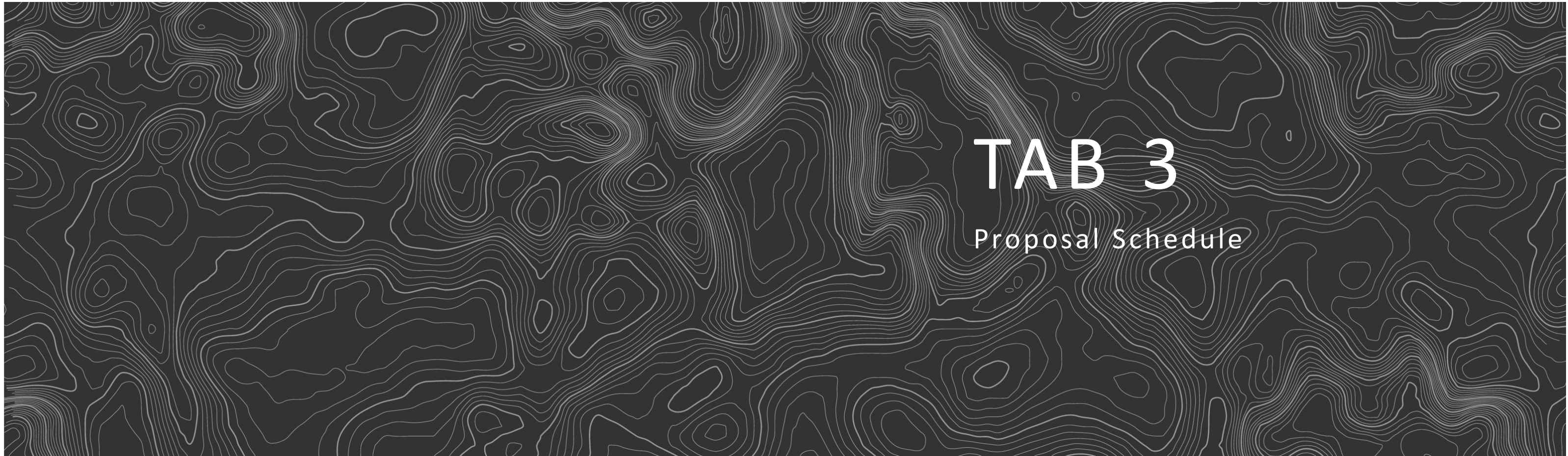
Item #	UTILITY COMPANY	ROADWAY CENTERLINE	TYPE OF FACILITY	SIZE	POLE NUMBER	STATIONS	LEFT, RIGHT, OR BOTH	OFFSETS FROM CENTERLINE	MEASUREMENT UNITS	QUANTITY	ADDITIONAL DESCRIPTIVE REMARKS	CONFLICT EVALUATION	ON ROW, OFF ROW, OR IN EASEMENT	COST RESPONSIBILITY	COST RESPONSIBILITY REASON CODE	DESCRIPTION OF MITIGATION MEASURES THAT D-B CAN PERFORM FOR UTILITY
1	VDOT	I-64 WB CONSTR	TC	Pole	Camera	329+43	L	28'	EA	1		No Conflict	ON ROW	Project	N/A	
2	VDOT	I-64 WB CONSTR	E	handhole	handhole	329+66	L	22'	EA	1		No Conflict	ON ROW	Project	N/A	
3	VDOT	I-64 WB CONSTR	E		Control Panel	329+78	L	26'	EA	1		No Conflict	ON ROW	Project	N/A	
4	VDOT	I-64 WB CONSTR	E	Solar	Solar	329+90	L	38'	EA	1		No Conflict	ON ROW	Project	N/A	
5	VDOT	Ramp No.2 CONSTR	E			417+00 - 423+61	R	24' - 29'	LF	654'		No Conflict	ON ROW	Project		
6	VDOT	I-81 NB CONSTR	E			2064+19 - 2065+23	R	42' - 39'	LF	109'		No Conflict	ON ROW	Project	N/A	
7	VDOT	I-81 NB CONSTR	E			2065+23	R	39' - 0'	LF	39'	Possible Conflict with Paved Shoulder Continues to 4	Possible Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
8	VDOT	I-81 NB CONSTR	E			2074+20 - 2079+53	R	37' - 39'	LF	537'	In Conflict with Guardrail	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
9	VDOT	I-81 NB CONSTR	E			2079+69 - 2081+43	R	36'	LF	184'		Possible Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
10	Verizon	I-81 NB CONSTR	MH			2080+50	R	161'	EA	1	manhole system conduit duct bank	No Conflict	OFF ROW	Project	7	
11	VDOT	I-81 NB CONSTR	E			2081+43 - 2086+60	R	35' - 44'	LF	102'	In Conflict with Guardrail	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
12	VDOT	I-81 NB CONSTR	E			2086+60	L	22' - 25'	LF	93'		No Conflict	ON ROW	Project	N/A	
13	VDOT	I-81 NB CONSTR	TC			2088+19 - 2089+35	R	12' - 7'	LF	114'	In Conflict with Bridge. Conduit attached to bottom of Bridge (Remove)	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
14	VDOT	I-81 NB CONSTR	TC			2089+35 - 2089+83	B	7' R - 125' L	LF	167'	In Conflict with Guardrail and Bridge Abutment? And storm drain Parageraph 3 in section 2.3.4 page 46, reference Special instructions	Possible Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
15	Dominion	I-81 NB CONSTR	E	Pole		2107+28	R	135'	EA	1		No Conflict	OFF ROW	Project	7	
16	SVE	I-81 NB CONSTR	E	Pole		2130+47	R	144'	EA	1		No Conflict	OFF ROW	Utility	7	
17	VDOT	I-81 SB CONSTR	E			3025+12 - 3027+85	B	79' R - 39' L	LF	387'		No Conflict	ON ROW	Project	N/A	
18	VDOT	I-81 SB CONSTR	E			3064+52 - 3077+49	L	44' - 48'	LF	1,300'		No Conflict	ON ROW	Project	N/A	
19	VDOT	I-81 SB CONSTR	E			3065+48	R	28' - 122'	LF	96'	In Conflict with SWM	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
20	VDOT	I-81 SB CONSTR	E			3065+48 - 3067+21	R	24' - 40'	LF	181'	In Conflict with new Guardrail	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
21	VDOT	I-81 SB CONSTR	E			3067+21 - 3077+54	R	21' - 25'	LF	1,030'	Possible Conflict with Paved Shoulder	Possible Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
22	VDOT	I-81 SB CONSTR	E			3074+48	R	110' - 23'	LF	88'	Possible Conflict with Paved Shoulder	Possible Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
23	ACSA	I-81 SB CONSTR	S	16"		3078+30 - 3079+03	B	158' L - 316' R	LF	484'	Check Median elevation? Protect during construction (Ductile Iron)	Possible Conflict	ON ROW	Project	4	Protect during construction
24	Verizon	I-81 SB CONSTR	T			3080+28 - 3080+57	B	141' L - 313' R	LF	459'	manhole system conduit duct bank	No Conflict	ON ROW	Utility		
25	Verizon	I-81 SB CONSTR	FO			3080+28 - 3080+57	B	141' L - 313' R	LF	459'	manhole system conduit duct bank	No Conflict	ON ROW	Utility		
26	Verizon	I-81 SB CONSTR	FO			3080+28 - 3080+57	B	141' L - 313' R	LF	459'	manhole system conduit duct bank	No Conflict	ON ROW	Utility		
27	Segra	I-81 SB CONSTR	FO			3080+28 - 3080+57	B	141' L - 313' R	LF	459'	manhole system conduit duct bank	No Conflict	ON ROW	Utility		
28	Verizon	I-81 SB CONSTR	MH			3080+50	L	141'	EA	1	manhole system conduit duct bank	No Conflict	OFF ROW	Project	7	
29	STA	I-81 SB CONSTR	W	10"		3087+65 - 3087+78	L	154' - 37'	LF	119'	Protect during construction	Possible Conflict	ON ROW	Project	4	Protect during construction
30	STA	I-81 SB CONSTR	W	10"		3087+65 - 3087+81	B	46' L - 233' R	LF	279'	Abandoned	No Conflict	ON ROW	Project	4	
31	STA	I-81 SB CONSTR	W	10"		3087+78 - 3087+81	B	38' L - 238' R	LF	280'		No Conflict	ON ROW	Project	4	
32	VDOT	I-81 SB CONSTR	TC			3088+12 - 3089+35	L	13'	LF	125'	In Conflict with Bridge. Conduit attached to bottom of Bridge (Remove)	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
33	ACSA	I-81 SB CONSTR	S	15"		3088+88	B	21' L - 141' R	LF	163'	(Concrete)	No Conflict	ON ROW	Project	4	
34	ACSA	I-81 SB CONSTR	S	15"		3088+88	L	375' - 21'	LF	351'	(Concrete)	No Conflict	ON ROW	Project	4	
35	ACSA	I-81 SB CONSTR	S	15"		3088+88	R	141' - 724'	LF	583'	(Concrete)	No Conflict	ON ROW	Project	4	
36	ACSA	I-81 SB CONSTR	MH			3088+88	L	21'	EA	1		No Conflict	ON ROW	Project	4	
37	ACSA	I-81 SB CONSTR	MH			3088+88	R	141'	EA	1		No Conflict	ON ROW	Project	4	
38	VDOT	I-81 SB CONSTR	E			3089+12 - 3090+21	L	222' - 33'	LF	235'	Abandoned? No Records Provided indicating this facility	No Conflict	ON ROW	Project	N/A	
39	VDOT	I-81 SB CONSTR	TC			3089+35 - 3090+43	B	13' L - 47' R	LF	164'	In Conflict with Guardrail and Bridge Abutment? (Remove)	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
40	VDOT	I-81 NB CONSTR	P		Camera	3089+75	R	145'	EA	1	Camera appears to communicate with radio. Is it powered by nearby solar? Protect during construction.	Possible Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
41	VDOT	I-81 SB CONSTR	E			3090+21 - 3091+18	B	33' L - 73' R	LF	144'	Abandoned? No Records Provided indicating this facility. Conflict with drainage	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
42	VDOT	I-81 NB CONSTR	PD		Solar Panel	3090+40	R	42'	EA	1	Protect during construction/Relocate	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
43	VDOT	I-81 NB CONSTR	P		Traffic Counter	3090+43	R	46'	EA	1	Protect during construction/Relocate	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
44	VDOT	I-81 SB CONSTR	E			3091+18 - 3093+40	R	65' - 80'	LF	220'	In Conflict with Drainage Basin?	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
45	VDOT	I-81 NB CONSTR	P		Camera	3093+40	R	80'	E	1	Camera appears to communicate with radio. Is it powered by nearby solar? Protect during construction/Relocate	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
46	VDOT	I-81 SB CONSTR	E			3103+38 - 3104+29	L	40' - 110'	LF	81'		No Conflict	ON ROW	Project		
47	Dominion	I-81 SB CONSTR	E	Pole		3107+21	L	112'	EA	1		No Conflict	OFF ROW	Project	7	
48	Comcast	I-81 SB CONSTR	OH Tel			3107+21 - 3107+50	B	110' L - 350' R	LF	461'		No Conflict	ON ROW	Utility		
49	Dominion	I-81 SB CONSTR	OH Elec			3107+21 - 3107+50	B	110' L - 350' R	LF	461'		No Conflict	ON ROW	Utility		
50	Columbia Gas	I-81 SB CONSTR	G		HP Main	3128+05 - 3128+13	B	303' R - 130' L	LF	433'	Protect during construction HP Main	Possible Conflict	ON ROW	Utility		Protect during construction HP Main

## UTILITY MATRIX

### Cost Responsibility Reason Codes

1. - 33.2-348 used on urban projects for utilities owned by a municipality, public utility district or public utility authority.; 2. - 33.2-307 (a) used on Interstate in cities or towns for utilities located in city streets.; 3. - 33.2-307 (b) used on Arterial Projects for utilities owned by a county, city, town or public utility authority located in existing streets.; 4. - 33.2-308 used on Interstate and Primary projects in counties for all utilities owned by a county or political subdivision of the state or county and for water or sanitary sewer owned by a city or town extending into any county.; 5. - 33.2-330 used on secondary projects for utilities owned by county, city, town, authority or district.; 6. - 33.1-1701 used on certain bond projects.; 7. - 33.2-1014 used for utilities located on private property.; 8. - Prior Rights.; 9. - Prior Agreements (provide date).; 10 - (other) was just part of a recent VDOT relocation.

Item #	UTILITY COMPANY	ROADWAY CENTERLINE	TYPE OF FACILITY	SIZE	POLE NUMBER	STATIONS	LEFT, RIGHT, OR BOTH	OFFSETS FROM CENTERLINE	MEASUREMENT UNITS	QUANTITY	ADDITIONAL DESCRIPTIVE REMARKS	CONFLICT EVALUATION	ON ROW, OFF ROW, OR IN EASEMENT	COST RESPONSIBILITY	COST RESPONSIBILITY REASON CODE	DESCRIPTION OF MITIGATION MEASURES THAT D-B CAN PERFORM FOR UTILITY
51	SVE	I-81 SB CONSTR	OH Elec			3130+07 - 3131+20	B	317' R - 185' L	LF	514'		No Conflict	ON ROW	Utility		
52	SVE	I-81 SB CONSTR	E	Pole		3131+17	L	182'	EA	1		No Conflict	OFF ROW	Utility	7	
53	Unknown	I-81 SB CONSTR	TC	2 - 3"		3179+37 - 3180+37	B	80' L - 200' R	LF	298'	Abandoned. Asbestos conduit	No Conflict	ON ROW	Project		
54	VDOT	I-81 SB CONSTR	E			3181+09 - 3183+54	L	52' - 91'	LF	250'		No Conflict	ON ROW	Project		
55	VDOT	I-81 SB CONSTR	T/Tg			3181+09 - 3183+54	L	52' - 91'	LF	250'		No Conflict	ON ROW	Project		
56	SVE	I-81 SB CONSTR	E	Pole	113412002	3182+00	L	120'	EA	1		No Conflict	ON ROW	Utility		
57	Comcast	I-81 SB CONSTR	OH Tel			3182+00 - 3182+50	B	120' L - 250' R	LF	378'		No Conflict	ON ROW	Utility		
58	SVE	I-81 SB CONSTR	OH Elec			3182+00 - 3182+50	B	120' L - 250' R	LF	378'		No Conflict	ON ROW	Utility		
59	SVE	I-81 SB CONSTR	E	Pole		3182+50	R	250'	EA	1		No Conflict	OFF ROW	Utility	7	
60	VDOT	I-81 SB CONSTR	E			3182+56 - 3183+54	L	61' - 70'	LF	95'		No Conflict	ON ROW	Project		
61	VDOT	I-81 SB CONSTR	T/Tg			3182+56 - 3183+54	L	61' - 70'	LF	95'		No Conflict	ON ROW	Project		
62	ACSA	I-81 SB CONSTR	MH			3218+67	R	352'	EA	1		No Conflict	OFF ROW	Project	7	
63	ACSA	I-81 SB CONSTR	MH			3218+85	L	96'	EA	1	<10' from Shentel planned relocate	No Conflict	ON ROW	Project	4	
64	ACSA	I-81 SB CONSTR	S	30"		3218+85 - 3218+67	B	96' L - 352' R	LF	445'	Protect during construction (concrete pipe)	Possible Conflict	ON ROW	Project	4	Protect during construction
65	Verizon	I-81 SB CONSTR	TC			3233+20 - 3235+54	B	278' R - 119' L	LF	461'	copper in 3.5inch iron pipe. In conflict with SWM cut in median.	In Conflict	ON ROW	Utility		Lower or relocate line to avoid conflict.
66	Buckingham Branch RR	AUGUSTA WOODS DR CONSTR	E	Pole		4001+38	R	69'	EA	1	Survey General Note 3. Aerial wires not in use as per contact with BBRR	No Conflict	ON ROW	Utility		
67	Buckingham Branch RR	AUGUSTA WOODS DR CONSTR	E	Pole		4002+14	R	68'	EA	1	Survey General Note 3. Aerial wires not in use as per contact with BBRR	No Conflict	ON ROW	Utility		
68	Buckingham Branch RR	AUGUSTA WOODS DR CONSTR	E	Pole		4003+18	R	66'	EA	1	Survey General Note 3. Aerial wires not in use as per contact with BBRR	Possible Conflict	ON ROW	Utility		Remove, Relocate or Temporary Support
69	Buckingham Branch RR	AUGUSTA WOODS DR CONSTR	E	Pole		4003+80	R	69'	EA	1	Survey General Note 3. Aerial wires not in use as per contact with BBRR	No Conflict	ON ROW	Utility		
70	Columbia Gas	RTE.250 EB CONSTR	G	3" CSMP		5018+42 - 5021+97	L	18' - 23'	LF	357'	Protect during construction	Possible Conflict	ON ROW	Utility		Protect during construction
71	VDOT	RTE.250 EB CONSTR	E			5019+8 - 5021+95	L	23'	LF	177'		No Conflict	ON ROW	Project	N/A	
72	VDOT	RTE.250 EB CONSTR	E			5021+95 - 5023+8	L	22' - 33'	LF	120'		No Conflict	ON ROW	Project	N/A	
73	Columbia Gas	RTE.250 EB CONSTR	G	4" PMP		5021+97 - 5027+35	L	21' - 23'	LF	535'		No Conflict	ON ROW	Utility		
74	Columbia Gas	RTE.250 EB CONSTR	G	1.25" steel		5021+97 - 5024+00	L	18' - 190'	LF	257'		No Conflict	ON ROW	Utility		
75	VDOT	RTE.250 WB CONSTR	TC			6016+50 - 6017+66	L	18' - 28'	LF	122'	In Conflict with Guardrail, Parageraph 3 in section 2.3.4 page 46, reference Special instructions	In Conflict	ON ROW	Project	N/A	VDOT Facilities are in-plan work items by default
76	Segra	RTE.250 WB CONSTR	FO			6016+50 - 6017+66	L	18' - 28'	LF	122'	In Conflict with Guardrail, Parageraph 3 in section 2.3.4 page 46, reference Special instructions (likely Segra owned fiber, leased to City of Staunton, in VDOT conduit)	In Conflict	ON ROW	Utility		Lower or relocate line to avoid conflict.
77	Segra	RTE.250 WB CONSTR	FO		Handhold	6016+90	L	39'	EA	1		No Conflict	ON ROW	Utility		
78	Segra	RTE.250 WB CONSTR	FO			6019+90 - 6021+81	L	39' - 41'	LF	490'		No Conflict	ON ROW	Utility		
79	Segra	RTE.250 WB CONSTR	FO		Handhold	6021+81	L	41'	EA	1		No Conflict	ON ROW	Utility		
80	VDOT	RTE.250 WB CONSTR	TC		Handhold	6017+66	L	28'	EA	1	Para. 3 in sect. 2.3.4 pg 46, ref Sp. Instrs.	No Conflict	ON ROW	Project	N/A	
81	VDOT	RTE.250 WB CONSTR	TC			6017+66 - 6019+94	L	28' - 32'	LF	223'	Para. 3 in sect. 2.3.4 pg 46, ref Sp. Instrs.	No Conflict	ON ROW	Project	N/A	
82	Segra	RTE.250 WB CONSTR	FO			6017+66 - 6019+94	L	28' - 32'	LF	223'	Para. 3 in sect. 2.3.4 pg 46, ref Sp. Instrs.	No Conflict	ON ROW	Utility		
83	VDOT	RTE.250 WB CONSTR	TC		Handhold	6019+94	L	32'	EA	1	Para. 3 in sect. 2.3.4 pg 46, ref Sp. Instrs.	No Conflict	ON ROW	Project	N/A	
84	VDOT	RTE.250 WB CONSTR	TC			6019+94 - 6021+65	L	32' - 45'	LF	174'	Para. 3 in sect. 2.3.4 pg 46, ref Sp. Instrs.	No Conflict	ON ROW	Project	N/A	
85	Segra	RTE.250 WB CONSTR	FO			6019+94 - 6021+65	L	32' - 45'	LF	174'	Para. 3 in sect. 2.3.4 pg 46, ref Sp. Instrs.	No Conflict	ON ROW	Utility		
86	VDOT	RTE.250 WB CONSTR	TC		Handhold	6021+65	L	28'	EA	1	Para. 3 in sect. 2.3.4 pg 46, ref Sp. Instrs.	No Conflict	ON ROW	Project	N/A	
87	VDOT	Ramp No.1 CONSTR	E			620+71 - 630+86.24	L	26' - 35'	LF	1,014'	Continues to 3	No Conflict	ON ROW	Project	N/A	
88	Shentel	I-81 SB CONSTR	FO			3017+00 - 3080+00	L	68' - 446'	LF	6,471'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
89	Shentel	I-81 SB CONSTR	FO			3079+70 - 3082+19	L	134' - 1,258'	LF	1,206'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
90	Shentel	I-81 SB CONSTR	FO			3080+00 - 3080+24	B	163' L - 298' R	LF	470'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
91	Shentel	I-81 SB CONSTR	FO			3089+65 - 3103+67	L	465' - 83'	LF	1,545'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
92	Shentel	I-81 SB CONSTR	FO			3103+67 - 3104+31	B	83' L - 360' R	LF	449'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
93	Shentel	I-81 SB CONSTR	FO			3103+67 - 3178+82	L	60' - 195'	LF	7,470'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
94	Shentel	I-81 SB CONSTR	FO			3178+82 - 3181+48	B	85' L - 570' R	LF	710'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
95	Shentel	I-81 SB CONSTR	FO			3178+82 - 3245+50	L	82' - 263'	LF	6,783'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design
96	Shentel	RTE.250 WB CONSTR	FO			6024+90 - 6033+00	R	115' - 53'	LF	816'	Approx location of planned new facilities	No Conflict	ON ROW	Utility	9	Ensure relocate does not conflict with Roadway Design



# TAB 3

Proposal Schedule





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