



TECHNICAL PROPOSAL | VOLUME I

# I-81 WIDENING MM 136.6 TO MM 141.8

ROANOKE COUNTY AND CITY OF SALEM, VIRGINIA

State Project No.: 0081-080-946, P101, R201, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

Federal Project No.: NHPP-0812 (330)

Contract ID Number: C00116203DB108



MARCH 3, 2021



Joint Venture

in association with Lead Designer





**SECTION 4.1**  
Letter of Submittal

March 3, 2021

Bryan Stevenson, PE, DBIA  
Alternative Project Delivery Division  
Virginia Department of Transportation  
1401 East Broad Street, Annex Building, 5th Floor  
Richmond, VA 23219



**RE: Technical Proposal | I-81 Widening MM 136.6 to MM 141.8, Roanoke County and City of Salem, VA State Project No.: 0081-080-946, P101, R201, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688 | Federal Project No.: NHPP-0812(330) | Contract ID Number: C00116203DB108**

Dear Mr. Stevenson,

Partnership will be fundamental to the success of the I-81 Widening MM 136.6 to MM 141.8 Design-Build (D-B) Project (the I-81 Project, or the Project). This complex endeavor demands a D-B team that seamlessly collaborates internally and with the Virginia Department of Transportation (VDOT). The **Branch-Orders Joint Venture** (Branch-Orders), as the Offeror, has thoughtfully assembled a Team that includes firms with extensive experience working on similar projects in the I-81 corridor. Branch-Orders will work with Lead Designer, **Whitman, Requardt & Associates, LLP** (WRA), to furnish a product that meets or exceeds design and construction expectations. The Branch-Orders Team (also called the Team) offers the following information as required by Section 4.1 of the Request for Proposals (RFP):

**4.1.1 Offeror's Official Information:** Branch-Orders, based at 442 Rutherford Ave, NE, Roanoke, VA 24016, is the Offeror and will be the overall authority on the project as well as the Lead Contractor.

**4.1.2 Declaration of Intent:** It is our team's intent to enter into a contract with VDOT for the I-81 Project in accordance with the terms of the RFP.

**4.1.3 120-Day Declaration:** The offer represented by the technical and price proposals will remain in full force and effect for 120 days after the price proposal is submitted.

**4.1.4 Point of Contact:**

Donald E. Bryson, Jr., Pursuit Manager  
442 Rutherford Avenue NE, Roanoke, VA 24016  
Phone: 704.572.1684 | Fax: 540.982.4216  
Email: donald.bryson@branchcivil.com

**4.1.5 Principal Officer of the Offeror:**

Jason Hoyle, Vice President  
442 Rutherford Avenue NE, Roanoke, VA 24016  
Phone: 540.982.1678 | Fax: 540.982.4216  
Email: jason.hoyle@branchcivil.com

**4.1.6 Final Completion Date:** Our Team commits to a timely Final Completion Date of **January 15, 2026**.

**4.1.7 Unique Milestone Dates:** Our team does not propose unique milestone dates for this 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.

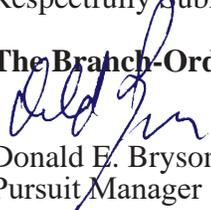
**4.1.9 Certification Regarding Debarment Forms:** Signed Primary and Lower Tier Debarment Forms are provided in Appendix 11.8.6 of this document.

**4.1.10 Disadvantaged Business Enterprise (DBE) Commitment:** Our team supports the DBE program and is committed to achieving or exceeding the 9% DBE participation goal for the entire value of the Contract.

Our Team acknowledges receipt of Addendum No. 1 dated December 16, 2020, Addendum No. 2 dated January 7, 2021, Addendum No. 3 dated January 27, 2021, and Addendum No. 4 dated February 12, 2021. We've included the signed Acknowledgment of RFP, Revision and/or Addenda Form (Attachment 3.7) in Appendix 3.7 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.

Respectfully Submitted,

**The Branch-Orders Joint Venture**

  
Donald E. Bryson, Jr.  
Pursuit Manager | Branch Civil, Inc.



## SECTION 4.2

### Offeror's Qualifications

## 4.2 OFFEROR'S QUALIFICATIONS

THE BRANCH-ORDERS TEAM WILL PARTNER WITH VDOT TO DELIVER CONSISTENT, QUALITY OPERATIONS. BASED ON OUR TEAM'S D-B LESSONS LEARNED AND EXPERIENCE IN THE I-81 CORRIDOR, WE HAVE INCORPORATED VALUE-ADDED PERSONNEL TO MAXIMIZE WORKERS' SAFETY AND THE TRAVELING PUBLIC AND MINIMIZE RISKS TO THE SCHEDULE AND BUDGET.

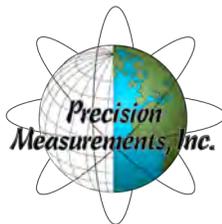
The Branch-Orders Team is comprised of leading roadway and bridge designers and design-build (D-B) contractors who understand the project's challenges and complexities, as well as VDOT's procedures and expectations. Our Team members have solved similar challenges on past projects and understand the importance of minimizing disruptions to local communities and the traveling public, with an emphasis on safety and the value of every dollar invested.

### 4.2.1 Confirmation Statement

Branch-Orders, as the Offeror, confirms that the information provided in our Statement of Qualifications (SOQ) dated July 8, 2020, remains true and accurate in accordance with the Request for Proposal (RFP) Section 4.2.1 requirements except for the following changes to our named Team members.

#### SURVEYING/SUBSURFACE UTILITY ENGINEERING

According to the Department's letter dated December 3, 2020, we understand that H&B Surveying and Mapping, LLC has a potential conflict of interest with the I-81 Project. We have added **Precision Measurements, Inc.** (PMI) as a replacement Team member to address this. PMI is a full-service land surveying firm with four offices in Virginia and others throughout the Southeast. With over 20 years of experience working for VDOT, PMI has performed surveying and SUE on seven VDOT D-B projects throughout the state.



PMI provides a full range of surveying services, including mapping, boundary surveys, verification surveys, platting, topographic surveys, 3-D scanning, route surveys, Global Positioning System (GPS) surveys, construction stakeout services, ALTA/ACSM land title surveys, and Geographic Information Systems (GIS), among others. **PMI is certified by VDOT as a Disadvantaged Business Enterprise (DBE) and by the Commonwealth of Virginia Minority Business Enterprise as a Small Woman and Minority (SWaM) business.**

#### LANDSCAPE DESIGN

In recognition of the Department's addition of landscape design services in the RFP, we have added **Land Planning and Design Associates, Inc.** (LPDA) to our Team.



LPDA has a wide range of experience in landscape architecture and planning services for roadways, interchanges, park-and-ride lots, pedestrian and bicycle facilities, and transportation-related design and improvement projects.

LPDA has an organized understanding and expertise in resolving land use issues that may arise. LPDA plays a crucial role in the public participation process and examines the impacts of design and improvements. LPDA serves Virginia and the Mid-Atlantic region with offices in Charlottesville and Sterling, Virginia, and is a certified SWaM and MICRO business.

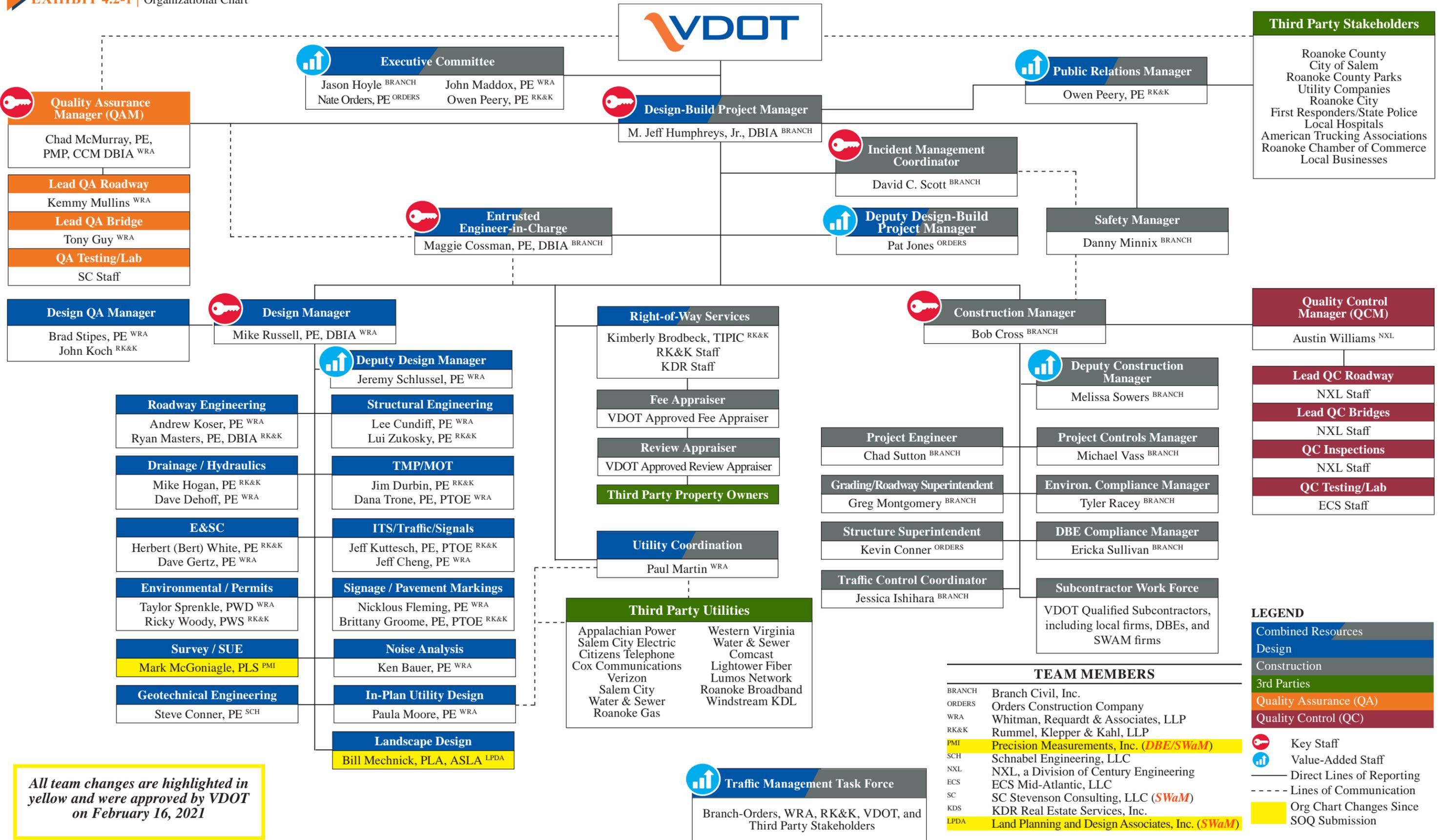
A copy of VDOT's approval of these changes, received on **February 16, 2021**, is included in this submittal's Appendices.

### 4.2.2 Organizational Chart

Under the leadership of Design-Build Project Manager (DBPM), **M. Jeff Humphreys, Jr., DBIA**, our Team is structured to effectively manage and deliver the design and construction of the I-81 Project. Our fusion of local, regional, and national expertise enables identifying and addressing challenges early, increasing delivery certainty. **We provide a dynamic, expert group of design and construction professionals with local, recent, and relevant D-B experience in the I-81 corridor.**

The functional relationships between positions and roles described in our SOQ narrative remain unchanged, true, and accurate. Our Organizational Chart, provided in **EXHIBIT 4.2-1** on page 3, indicates personnel changes in yellow highlights.

**EXHIBIT 4.2-1** | Organizational Chart





# SECTION 4.3

## Design Concept

# 4.3 DESIGN CONCEPT

**SIMPLER IS SAFER.** OUR CONCEPTUAL DESIGN PROVIDES EFFICIENCY AND SIGNIFICANTLY REDUCES TRAFFIC SHIFTS IN THE WORK ZONE. THIS ALLOWS FOR SAFE CONSTRUCTION OPERATIONS AND ENSURES THE NEEDS OF VDOT, STAKEHOLDERS, RESIDENTS, AND BUSINESSES ARE NOT OVERLOOKED.

The Branch-Orders 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. Our Team has delivered similarly challenging projects for VDOT within budget and schedule and will successfully deliver the final completion of the I-81 Project on **January 15, 2026**.

Our Conceptual Design for the I-81 Project, located behind "**TAB 1**" in Volume II, builds upon our overall D-B and I-81 corridor experience to deliver VDOT and other stakeholders' best value. Key aspects and

enhancements are highlighted below in **EXHIBIT 4.3-1** and described throughout this section.

## 4.3.1.1 Conceptual Roadway Plans

Our Team has reviewed the preliminary plans and details presented in the RFP documents. We have developed a Conceptual Design that will enhance safety, operations, schedule, construction, public acceptance, cost savings, and long-term sustainability benefits for end-users. Our Conceptual Design meets or exceeds the design requirements. Also, all criteria of the RFP and Addenda are met or exceeded. Our Conceptual and Final Designs will address all of the RFP objectives, including a more efficient design,

### **EXHIBIT 4.3-1** | Branch-Orders Team Project Features and Enhancements

ENHANCEMENT	BENEFITS	SAFETY	OPERATIONS	SCHEDULE	CONSTRUCTABILITY	PUBLIC ACCEPTANCE	LONG-TERM LOW MAINT	COST SAVINGS
<b>Modifications to the I-81 Baselines over Route 112 to Superelevate the Bridges</b>	<ul style="list-style-type: none"> <li>Significantly reduces the grade change on I-81 to simplify maintenance of traffic (MOT).</li> <li>Significantly reduces construction time and driver exposure to construction operations.</li> <li>Eliminates the RFP Design for 12' tangent lane shift (STA 543+50 to STA 554+50) by offsetting the PGL within a fully superelevated section.</li> </ul>	○	○	○	○	○	○	○
<b>I-81 Baseline Modifications North of the Route 112 Bridges</b>	<ul style="list-style-type: none"> <li>Eliminates the 1,500' Median Shoulder Design Exception.</li> <li>Improves the consistency of lane configurations during construction.</li> </ul>	○	○	○	○	○	○	○
<b>Loop Ramp D Safety Improvements</b>	<ul style="list-style-type: none"> <li>Modifies the departure curve radius from 250' to 320'.</li> <li>Modifies the grading between SB I-81, Loop Ramp D, and Ramp D to be 6:1 or flatter, exceeding the RFP 4:1 requirement.</li> </ul>	○	○	○	○	○	○	○
<b>Modifications to the Route 112, Route 635, and Route 619 Bridges</b>	<ul style="list-style-type: none"> <li>Reduces bridge and construction phases, thus reducing construction time, improving worker safety and increasing driver consistency.</li> <li>Eliminates long temporary alignments and lane shifts during construction.</li> <li>Streamlines traffic operations during construction, which minimizes opportunity for traffic disruptions and driver exposure to construction and congestion.</li> <li>Minimizes impacts/widening to the outside shoulder and preserves existing trees.</li> <li>Eliminates the need for retaining wall or box culvert extension at STA 618+00.</li> </ul>	○	○	○	○	○	○	○

**EXHIBIT 4.3-1** | Branch-Orders Team Project Features and Enhancements (*continued*)

ENHANCEMENT	BENEFITS	SAFETY	OPERATIONS	SCHEDULE	CONSTRUCTABILITY	PUBLIC ACCEPTANCE	LONG-TERM LOW MAINT	COST SAVINGS
<b>The I-81 SB North of Route 705 (Red Lane) Baseline is Modified to Shift Proposed Lanes toward the Median</b>	<ul style="list-style-type: none"> <li>Reduces construction time.</li> <li>Reduces driver exposure to construction and delays.</li> <li>Reduces footprint by keeping the outside edge of pavement on or within the existing outside edge of pavement.</li> <li>Maintains a 12' outside shoulder below the existing Route 705 Bridge.</li> </ul>	○	○	○	○	○	○	○
<b>The I-81 NB Baseline at the Bridge over Route 630 (Kessler Mill Road) is Modified to Match the I-81 As-built Plans</b>	<ul style="list-style-type: none"> <li>Allows traffic to flow parallel to the existing bridge.</li> <li>Avoids conflicts during construction.</li> <li>Avoids unexpected lane arrangements.</li> <li>Avoids the need to rework pavement in the median.</li> </ul>	○	○	○	○	○	○	○
<b>Cut Slope Optimizations to Minimize Cut Slopes (Where No Widening is Taking Place, the Existing Side Slopes will be Maintained)</b>	<ul style="list-style-type: none"> <li>Minimizes the Project footprint.</li> <li>Minimizes impacts to existing stable slopes.</li> <li>Minimizes impacts to existing rock slopes and associated traffic impacts due to rock blasting.</li> <li>Minimizes construction impacts to traffic for hauling materials.</li> <li>Minimizes the potential for ROW impacts.</li> </ul>	○	○	○	○	○	○	○
<b>Retaining Wall Panels As Noise Walls</b>	<ul style="list-style-type: none"> <li>Minimizes the Project footprint.</li> <li>Minimizes the potential for ROW impacts.</li> </ul>			○	○	○	○	○
<b>Minimizations to ROW Impacts throughout the Project</b>	<ul style="list-style-type: none"> <li>Minimizes the Project footprint.</li> <li>Minimizes VDOT costs for additional ROW acquisitions.</li> <li>Reduces public concerns about ROW takes.</li> </ul>			○	○	○	○	○
<b>Modifications to Structure Phasing</b>	<ul style="list-style-type: none"> <li>Exceeds the minimum clear roadway width at all bridges during construction.</li> <li>Eliminates a phase of construction at all bridges.</li> </ul>	○	○	○	○	○		○
<b>MOT Optimizations</b>	<ul style="list-style-type: none"> <li>Increases the Phase 3 bridge construction clear roadway width.</li> </ul>	○	○		○	○		
<b>Modifications to Retaining Wall Locations in Fill Sections</b>	<ul style="list-style-type: none"> <li>Minimizes the Project footprint.</li> <li>Minimizes the potential for ROW impacts.</li> <li>Minimizes impacts to wetlands.</li> <li>Reduces earthwork, which minimizes construction/hauling traffic.</li> <li>Reduces the height of multiple retaining walls.</li> </ul>	○	○	○	○	○	○	○

improved constructability, and an approach that limits risks to the Department, Project, public, and stakeholders. Final plans will be prepared using MicroStation and OpenRoads Designer. Electronic submissions of plans, reports, and calculations will follow VDOT's process, including an associated quality assurance and quality control (QA/QC) documentation, including

VDOT's LD-436 QC checklist. Our Team will provide plans in .dgn and .pdf formats and as paper copies at the milestones outlined in the RFP. Each submission will undergo an internal quality review process before submission. Upon final completion, we will provide As-Built plans documenting all design changes incorporated during construction.

**EXHIBIT 4.3-2** | Geometric Features

LOCATION	FUNCTIONAL CLASSIFICATION/ GEOMETRIC DESIGN STANDARD	DESIGN POSTED SPEED (MPH)	NUMBER/ WIDTH OF LANE(S)
I-81	GS-INT	65 MPH	Three (per direction)/12'
Route 112 Ramp A Route 112 Ramp B Route 311 Ramp A Route 311 Ramp B	GS-R	45 MPH	One/16'
Route 112 Ramp D	GS-R	40 MPH	One/16'
Route 311 Ramp D	GS-R	35 MPH	One/18'
Route 419 Ramp B Route 419 Ramp D	GS-R	35 MPH	One/16'
Route 112 Loop D	GS-R	30 MPH	One/16'
Route 311 Loop D Route 419 Loop B Route 419 Loop D	GS-R	25 MPH	One/18'
Route 112 Loop D Spur	GS-R	20 MPH	One/18'
Route 112 (Wildwood Road)	GS-5	35 MPH	N/A
Route 635 (Goodwin Avenue)	GS-7	35 MPH (Roanoke County) 30 MPH (City of Salem)	One (per direction)/11'
Route 619 (Wildwood Road)	GS-7	35 MPH (Roanoke County) 30 MPH (City of Salem)	N/A

**(A) GENERAL GEOMETRY, INCLUDING HORIZONTAL CURVE DATA AND ASSOCIATED DESIGN SPEEDS**

Our Conceptual Design, provided behind "TAB 1-A" in Volume II, provides a six-lane facility with a median barrier throughout most of the project limits, providing three mainline lanes in each direction. This design meets or exceeds RFP requirements, the Design Criteria Table Attachment 2.2, and the RFP Design intent. Our Conceptual Design includes information detailing horizontal curve data, the number and width of lanes and shoulders, and improved cross slope or rollover differential in accordance with the RFP.

**EXHIBIT 4.3-2** above summarizes pertinent geometric features for the major roadway components and matches the Design Criteria provided in the RFP.

**(B) HORIZONTAL ALIGNMENTS**

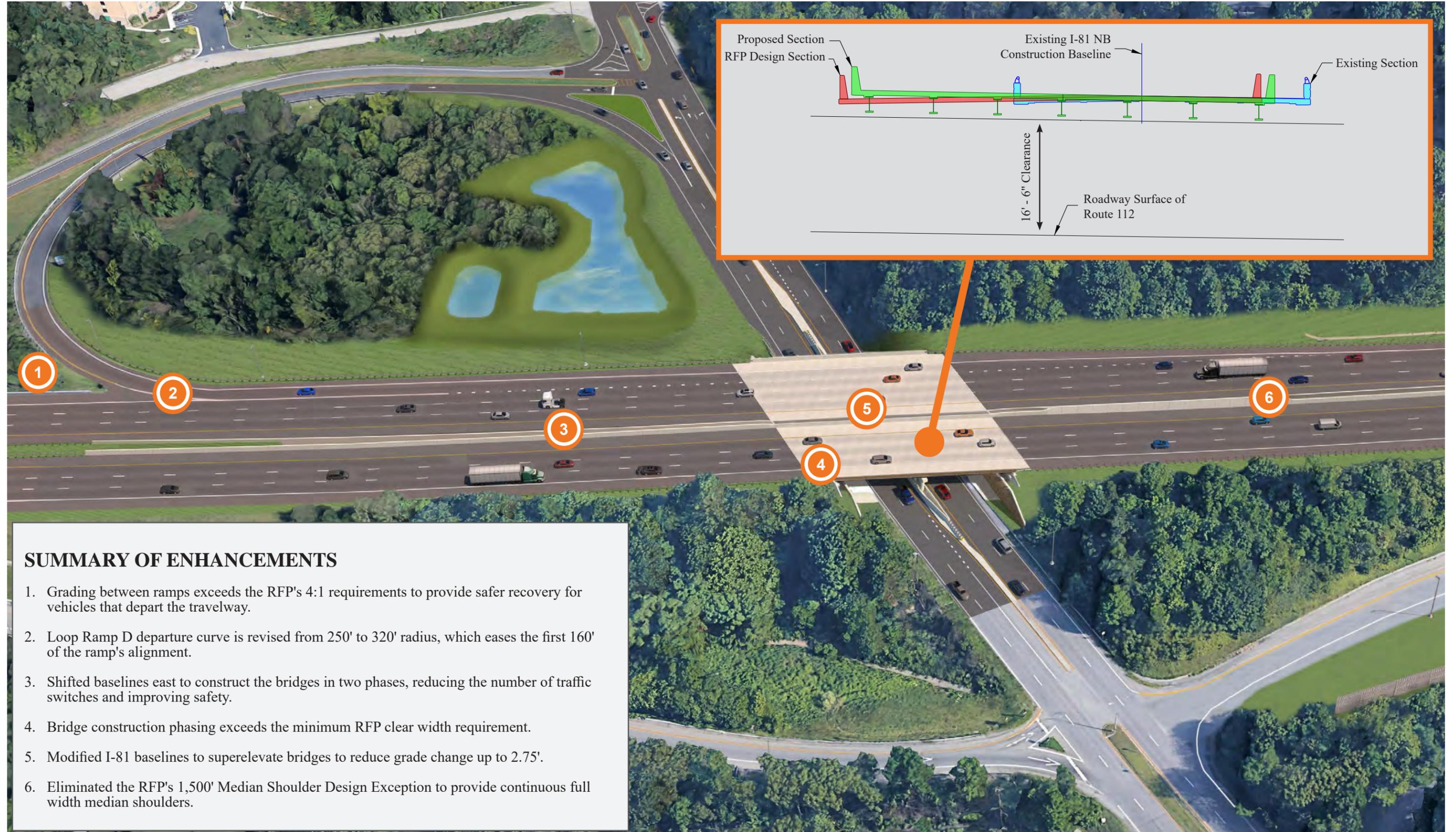
The proposed horizontal alignment provides three thru-lanes in each direction. **However, we provided optimizations to accelerate construction and reduce construction-related delays and potential impacts to the traveling public.** Our Conceptual Design achieves this by performing most of the northbound (NB) widening toward the Project's median, while providing most southbound (SB) widening to the outside of the existing travel way. This alignment will maintain, at

a minimum, the required overall clear roadway and shoulder width of 34' throughout construction. It also allows all median construction, median drainage, and widened roadways and bridges to take place simultaneously for both the NB and SB directions. Doing so provides the opportunity to combine ingress and egress points in many locations, thereby **minimizing traffic impacts**. Our Team has modified the RFP alignment in many places to **reduce impacts, improve constructability and safety during construction, and maximize existing pavement reuse**.

**Our Team modified the RFP baselines from 1,000' south to 1,200' north of the Route 112 Bridge.** As shown in **EXHIBIT 4.3-3** on the next page, horizontal curves allow the bridges over Route 112 to be super-elevated, which:

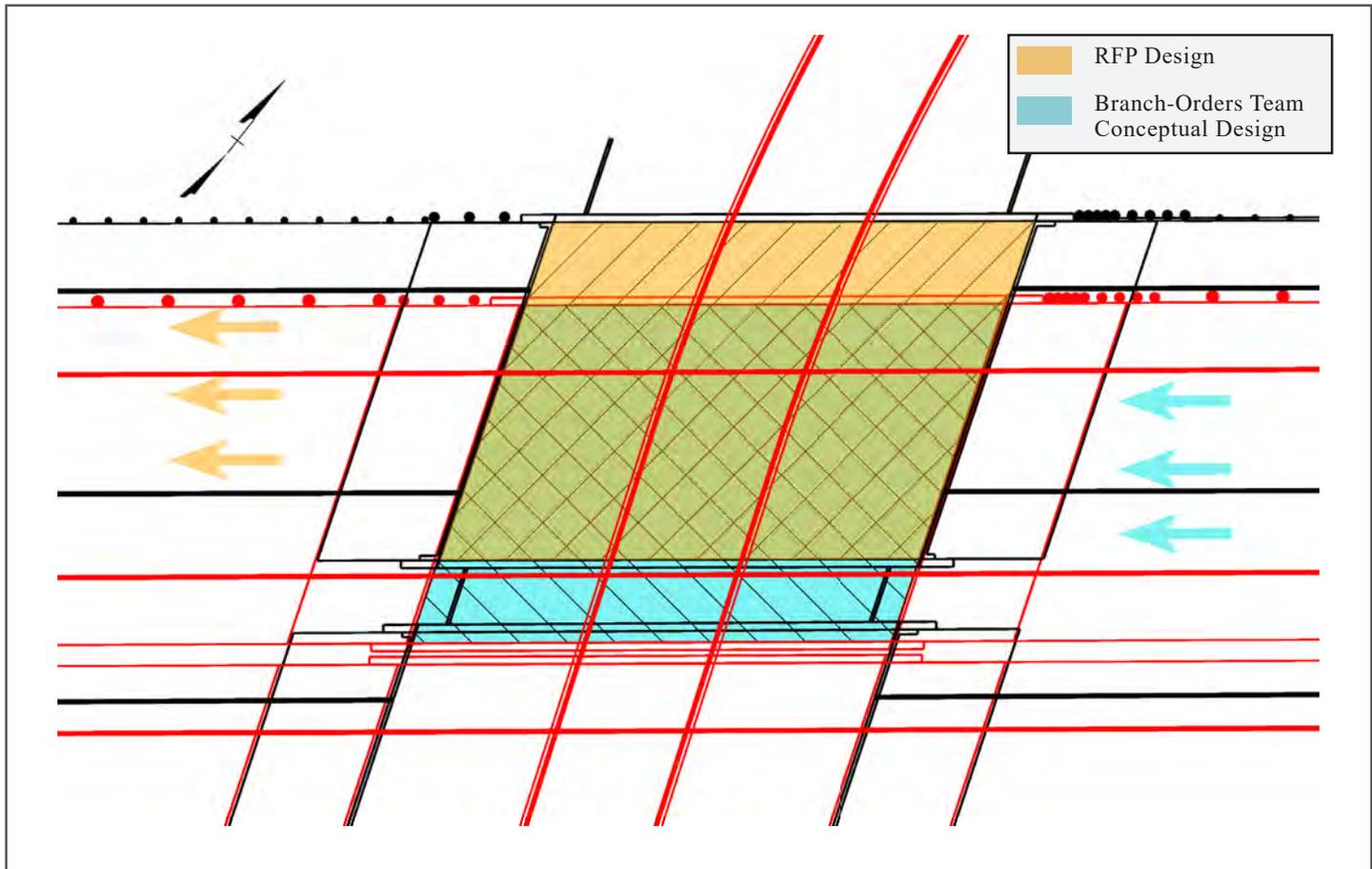
- Allows the design to achieve the minimum clearance of the bridges over Route 112 more efficiently than the RFP Design. This reduces the height of mainline grade change in the RFP Design up to 2.75'.
- Accelerates construction by reducing the amount of build-up by up to 2.75'. This reduces driver exposure to construction operations and improves safety.
- Allows the construction of bridges over Route 112 to be performed in two phases instead of the three shown in the RFP Design, accelerating construction and improving safety.

EXHIBIT 4.3-3 | Exit 137 - Route 112 Design Enhancements



### SUMMARY OF ENHANCEMENTS

1. Grading between ramps exceeds the RFP's 4:1 requirements to provide safer recovery for vehicles that depart the travelway.
2. Loop Ramp D departure curve is revised from 250' to 320' radius, which eases the first 160' of the ramp's alignment.
3. Shifted baselines east to construct the bridges in two phases, reducing the number of traffic switches and improving safety.
4. Bridge construction phasing exceeds the minimum RFP clear width requirement.
5. Modified I-81 baselines to superelevate bridges to reduce grade change up to 2.75'.
6. Eliminated the RFP's 1,500' Median Shoulder Design Exception to provide continuous full width median shoulders.

 **EXHIBIT 4.3-4** | I-81 SB over Route 635 Alignment Revision


- Eliminates the RFP Design's 12' lane shift (STA 543+50 to STA 554+50) by offsetting the PGL within a fully superelevated section. This elimination also accelerates construction and improves safety.
- Eliminates the need for the planned Design Exception for reduced median shoulders between STA 137+00 and STA 152+00, improving long-term emergency operations and safety.

**Our Team modified the RFP baseline at the Route 635 and Route 619 bridges by shifting the baseline toward the median.** As demonstrated above in **EXHIBIT 4.3-4**, these modifications to the alignment:

- Shifts more construction toward the median of the roadway.
- Allows for the roadway and the Route 635 and Route 619 bridges to be constructed in two primary phases instead of the three in the RFP Design.
- Reduces tree clearing by 101,000 SF.
- Eliminates the need for a retaining wall or box culvert extension at STA 618+00.
- Accelerates construction, reduces driver exposure to construction operations, and improves safety.

**Our Team modified the RFP Design's SB baseline north of Route 705 by shifting the baseline and proposed lanes toward the median.** This modification to the alignment:

- Provides a more consistent alignment and travel way, which is safer concerning driver expectancy and easier to construct.
- Accelerates construction, reduces driver exposure to construction operations, and improves safety.
- Eliminates the sliver cut, which reduces the overall Project footprint.
- Reduces the length and height of the retaining wall at STA 661+00.

**Our Team modified the I-81 NB Baseline at the bridge over Route 630 (Kessler Mill Road) to match the I-81 As-Built plans.** This modification to the alignment:

- Allows the baseline to be parallel to the bridge parapets over Route 630.
- Roadway approaches to the bridge will better line up with the existing bridge.

**Our design of the Route 112 Loop D is in accordance with Attachment 2.2, the Design Criteria Chart, of the RFP.** This provides safety improvements at the intersection of Route 112 and Loop D intersection, and includes the following enhancements:

- Modifies the departure curve radius from 250' to 320'.
- A minimum 70' storage length for the left turn from Route 112 Loop D to Route 112.
- Re-striping to match the Pavement Marking Concept provided in the RFP Information Package. This action offers a free-flow condition for right-turning traffic from Route 112 Loop Ramp D to Route 112.
- Accommodation of WB-67s at all intersection turning movements.
- Providing grading out to the “clearing line” shown on the RFP Design along the Route 112 Loop D Exit Ramp.
- The area between the SB I-81 mainline, Route 112 Loop D Exit Ramp, and Route 112 Ramp D SB Entrance Ramp is re-graded to 6:1 or flatter. This action exceeds the 4:1 minimum requirement to enhance safety for vehicles departing the roadway.

**(C) MAXIMUM GRADE FOR ALL SEGMENTS AND CONNECTORS**

As demonstrated in **EXHIBIT 4.3-5**, our Conceptual Design meets the RFP requirements as defined in Part 2 of the RFP and the Design Criteria Table Attachment 2.2. Additionally, our vertical alignments:

- Reduce the vertical grade change on I-81 at Route 112 by up to 2.75', which will accelerate construction and improve safety.
- Correct the RFP Design's Route 635 profile to provide vertical clearance for future I-81 widening.

**(D) TYPICAL SECTIONS OF ROADWAY SEGMENTS (RAMPS, RETAINING WALLS, AND BRIDGE STRUCTURES)**

**■ Roadway Sections**

Our Team's typical sections, provided in our Conceptual Design behind "**TAB 1-A**" of Volume II, graphically depict the proposed roadway design intent and fully comply with Part 2 of the RFP. Our Conceptual Design attempts to utilize the existing roadway as much as possible and practical. Much of our Conceptual Design has a median width of less than 15'. We will provide a median treatment that eliminates mowing and regular maintenance whenever the median is less than 15' (shoulder-to-shoulder). All median areas greater than 15' will be grass.

Our Conceptual Design will maintain the existing roadway cross slope where slope correction is not

**EXHIBIT 4.3-5 | Maximum Grade Comparison**

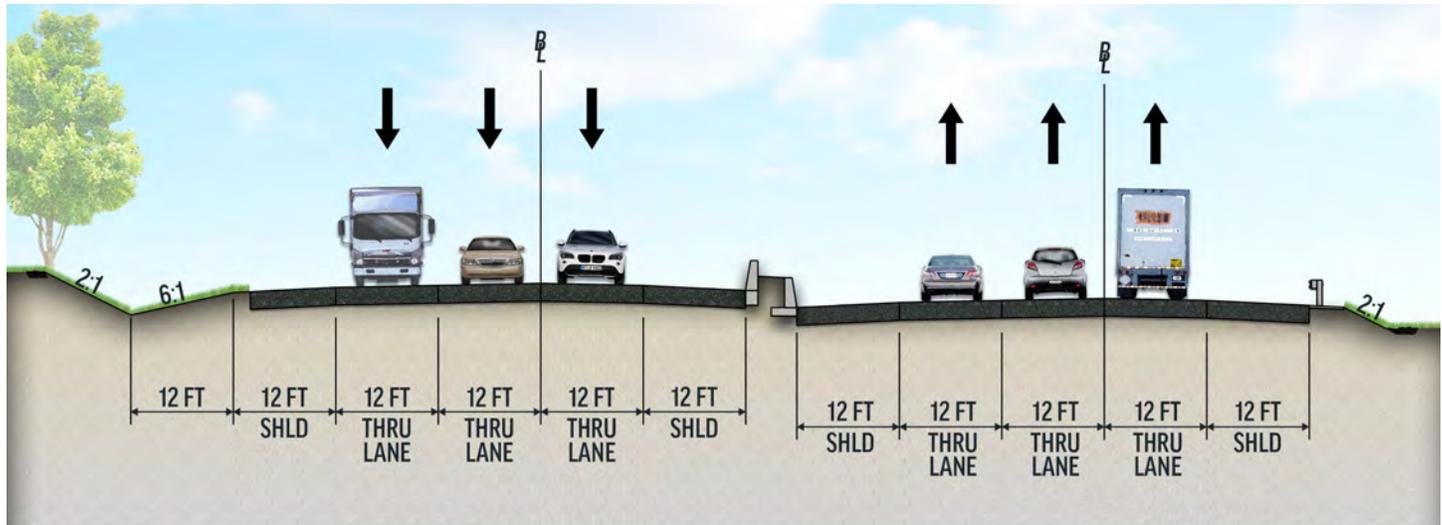
LOCATION	BRANCH-ORDERS MAXIMUM GRADE	ALLOWABLE MAXIMUM GRADE
I-81	3.5%	4%
Route 112 Ramp A	4.7%	3-5%
Route 112 Ramp B	3.6%	3-5%
Route 112 Ramp D	4.0%	4-6%
Route 112 Loop D	1.5%	5-7%
Route 112 Loop D Spur	3.0%	6-8%
Route 112 (Wildwood Rd.)	N/A	N/A
Route 311 Ramp A	3.6%	3-5%
Route 311 Ramp B	1.3%	3-5%
Route 311 Ramp D	2.9%	4-6%
Route 311 Loop D	3.7%	5-7%
Route 419 Ramp B	2.3%	4-6%
Route 419 Ramp D	3.7%	4-6%
Route 419 Loop B	2.8%	5-7%
Route 419 Loop D	3.2%	5-7%
Route 635 (Goodwin Ave.)	7.0%	10%
Route 619 (Wildwood Rd.)	N/A	N/A

needed. Our Team will apply VDOT standards in locations where:

- Existing cross slopes in areas of normal crown that are less than 1%.
- An existing or proposed rollover break between travel lanes exceeds 6%.
- The average superelevation within a horizontal curve is below VDOT's standard by more than 1%.
- All new full-width pavement sections.
- Vertical alignment increases of more than 3" as measured in accordance with the RFP.
- Horizontal alignment shifts of more than 12' from the existing.

Our Conceptual Design utilizes guardrail or concrete barrier where required by Appendix J of the *VDOT Road Design Manual* or AASHTO standards. The Conceptual Design also includes pier protection, where required. Roadside grading will be in accordance with VDOT Standards CS-4 as required in Part 2 of the RFP and the Design Criteria Table Attachment 2.2 and includes clearing of clear zones not protected by a barrier. In locations where no widening to the outside is occurring, our Team

## EXHIBIT 4.3-6 | Roadway Typical Section



will utilize existing side slopes. The Conceptual Design includes retaining walls outside of the clear zone. These are generally in the same locations as the RFP Design, with the following notable exceptions, where wall heights are reduced by up to 6':

- STA 660+67.20 to STA 664+43.55
- STA 669+01.72 to STA 669+94.90
- STA 713+85.01 to STA 714+60.62

Our Team will protect noise barrier locations within the clear zone with a constant slope barrier per the RFP. Also, our Conceptual Design utilizes retaining panels to minimize grading impacts and proposed ROW. **These activities are a direct benefit to the environment, VDOT, and the Public.** We developed typical sections to reduce impacts to existing trees and plants to minimize construction runoff and reduce stormwater management (SWM) requirements.

Our Team will develop a Landscape Plan to denote proposed areas that will be planted and reforested. The plan will meet all requirements of Part 2 of the RFP (Section 2.8) and will be developed by a landscape architect licensed in the Commonwealth of Virginia. The most common typical roadway section our Team will utilize on this Project is provided above in **EXHIBIT 4.3-6**.

### ■ Bridge Structures

The typical sections of bridges, located in our Conceptual Design behind "**TAB 1-B**" of Volume II, conform to *VDOT Structure and Bridge Manual, Volume V, Part 2, Chapter 6*, and Part 2 of the RFP. Bridges will be designed in close coordination with the roadway plans and MOT requirements specific to each location.

## (E) CONCEPTUAL HYDRAULIC AND STORMWATER MANAGEMENT DESIGN

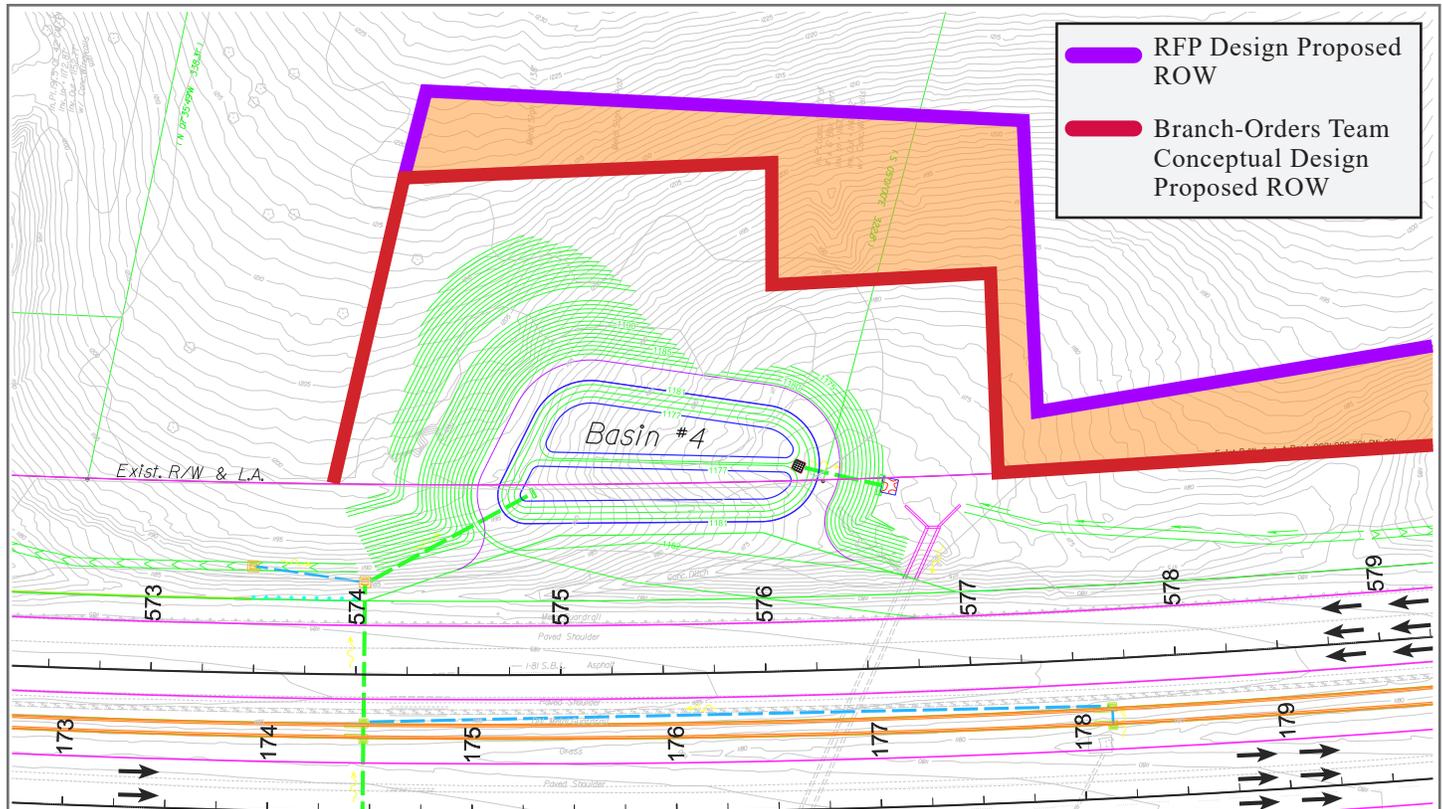
Our SWM approach emphasizes feasibility and constructability to provide a solution that satisfies VDOT and Virginia Department of Environmental Quality's (DEQ) requirements. We understand how to navigate the multiple layers of the DEQ's Virginia Stormwater Management Program (VSMP) regulations while engineering a proposed solution that **minimizes costs and long-term maintenance requirements**. Critical for the I-81 Project is the ability to understand and meet the Project's SWM needs within the ROW constraints while satisfying the design guidance of the RFP. 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 Design.

### ■ Consolidation of Drainage Outfalls

Our Team's initial analysis of the RFP showed that some of the existing outfalls along I-81 have insufficient space for a stormwater management facility and

Our Team has significant experience with interstate designs, including the I-64 Widening MM 200-205 in Richmond District (WRA), I-81 Exit 14 Interchange Improvements in the Bristol District (RK&K), I-64 and Route 623 Interchange Improvements in Richmond District (RK&K), and Route 3 and I-95 Interchange in Fredericksburg District (WRA). This experience provides our Team the knowledge and understanding needed to meet the stormwater challenges on this Project.

### EXHIBIT 4.3-7 | Decreased BMP Footprint and Reduced ROW at Stormwater Basin #4



are inadequate to convey the post-construction project peak discharges. We will mitigate this condition by diverting runoff away from the outfall through the storm drain to areas where the runoff can be sufficiently detained and treated by a BMP facility. **This approach protects VDOT from potential liability from downstream flooding impacts while also providing the necessary on-site project water quality treatment.**

Another advantage of outfall consolidation is that it can reduce the number of pipes that need to be jack-and-bored under I-81, minimizing construction risk, cost, and long-term maintenance for VDOT. Example locations where our Team proposes this approach is:

- Abandoning the existing I-81 SB culvert under SB STA 516+75 and conveying the runoff with storm drain to the proposed BMP left of SB STA 529+00.
- Diverting runoff from the inadequate outfall at STA 172+50 NB to the proposed BMP left of SB STA 575+00.

#### ■ Strategic BMP Type Selection and Grading

Because much of the I-81 corridor has steep topography, a BMP with a small footprint can require substantial grading and ROW/easement acquisition to chase slopes in some areas. Our Team has accounted for this by carefully selecting BMP types, locations, and grading footprints to minimize the ROW needed

for this Project, **ultimately reducing long-term maintenance costs.** Examples include:

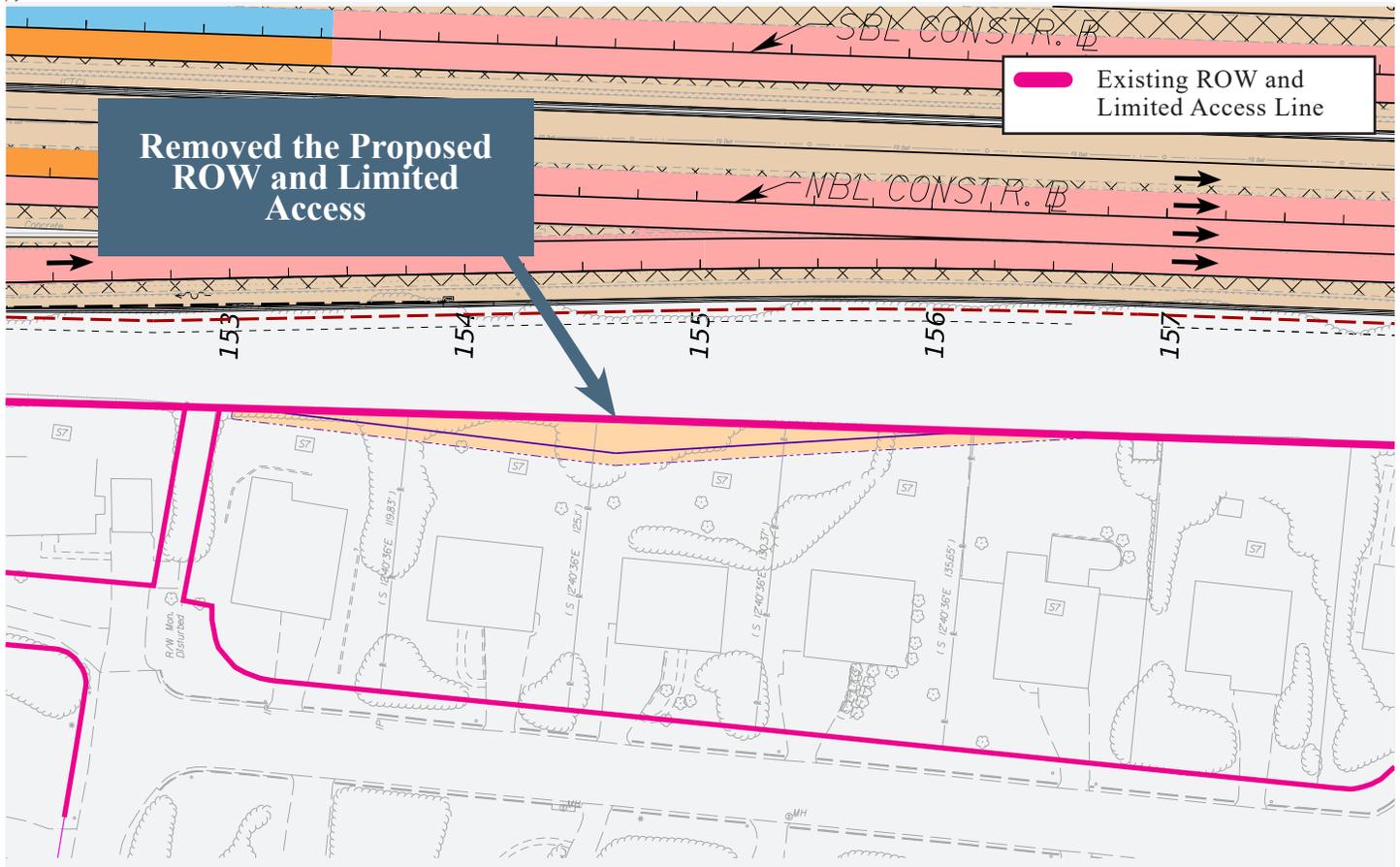
- Maximizing nutrient credit purchase to satisfy up to 25% of the required project water quality treatment.
- Proposing BMPs within existing VDOT ROW areas, such as within the Route 112/Wildwood Road loop interchange.
- As shown above in **EXHIBIT 4.3-7**, refining the grading of the proposed BMP facility left of I-81 SB STA 575+00 significantly reduces the area of proposed ROW shown in the RFP Design.
- Eliminating over 1,000 LF of the linear swale BMP depicted in the RFP Design from I-81 SB STA 582+00 to 593+50, reducing grading and ROW impacts.

#### ■ Providing BMP Access from Local Roads for Safety

We understand that providing access to BMPs from local roadways during and after construction will be safer. For this reason, we have strategically located and graded the following proposed BMP facilities to facilitate access from local roads:

- The proposed BMP facility left of I-81 SB STA 529+00 will be accessed from the Wildwood Road eastbound lane.
- The proposed BMP facility right of I-81 NB STA 149+00 will be accessed from Burma Road.

**EXHIBIT 4.3-8** | ROW Reductions



- The proposed BMP facility right of I-81 NB STA 163+00 will be accessed from Starview Drive.
- The proposed BMP facility left of I-81 SB STA 600+00 will be accessed from Route 635/ Goodwin Avenue.

**Robust E&SC and Temporary Drainage Design**

Our Team understands that DEQ has made recent inquiries on a statewide basis about ensuring 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:

- 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. In general, this equates to one sediment trap for every 2,000 LF of roadway on the I-81 Project.
- Developing proposed median storm drain inlet spacing so that runoff spread is contained within the shoulders, including during phased MOT when the shoulder areas are temporarily reduced in width.

**(F) PROPOSED RIGHT OF WAY LIMITS**

Understanding how ROW can affect the Project's schedule and how to mitigate its effects was a priority in the development of our Conceptual Design. The result is a design that **reduces the Project footprint, minimizes the amount of acquisition, and reduces the number of parcels impacted.**

**EXHIBIT 4.3-8** above presents a representative example of how we provide ROW reductions. Additionally, **EXHIBIT 4.3-9** below demonstrates our overall reduction in ROW on this Project. We will also prioritize the ROW acquisitions for this Project to align with our schedule.

**EXHIBIT 4.3-9** | Reductions in ROW versus RFP

	# OF PARCELS	ROW (SF)	EASEMENTS (SF)
RFP Design	56	474,425	40,397
Team Design	36	389,583	31,137
Proposed Reductions	20	84,842	9,260

**EXHIBIT 4.3-10** | Utility Conflicts and Potential Mitigation Strategies

UTILITY DESCRIPTION	APPROXIMATE LOCATION	POTENTIAL IMPACT	MITIGATION STRATEGIES
Citizen's Telephone Fiber Optic Line	Throughout the entire Project.	Multiple conflicts with roadway widening and bridge construction.	Relocate lines to outside of the shoulders of I-81.
VDOT	Throughout the entire Project.	Multiple conflicts with roadway widening and bridge construction.	Relocate lines to outside of the shoulders of I-81.
Comcast Cable Television	Along Route 112 at I-81 bridge.	Conflict with proposed bridge substructure.	Relocate cable to the edge of Route 112.
Verizon Phone/Cable	Along Route 112 at I-81 bridge.	Conflict with proposed bridge substructure.	Relocate cable to the edge of Route 112.
Roanoke Gas 4" Line	Along Route 112 south of I-81.	Possible conflict with replacement storm pipes.	Raise or lower existing line to avoid conflicts.
City of Salem 12" Water	Along Route 112 south of I-81.	Possible conflict with replacement storm pipes.	Raise or lower existing line to avoid conflicts.
WVWS 10" Sewer	Along Route 112 south of I-81.	Possible conflict with replacement storm pipes.	Raise or lower existing line to avoid conflicts.
Citizen's Telephone Fiber Optic Line	Along Route 112 at I-81 NB on-ramp.	Possible conflict with replacement storm pipes.	Raise or lower existing line to avoid conflicts.
Verizon Fiber Optic Ducts	Crossing I-81 near STA 559+50.	Possible conflict with storm pipe.	Raise or lower existing line to avoid conflicts.
City of Salem 6" Water	Along Route 635 south of I-81.	Possible conflict with replacement storm pipes.	Raise or lower existing line to avoid conflicts.
City of Salem 8" Water	Crossing I-81 at STA 642+35.	Possible conflict with storm pipe.	Raise or lower existing line to avoid conflicts.
City of Salem 8" Water	Crossing I-81 at STA 643+75.	Possible conflict with storm pipe.	Raise or lower existing line to avoid conflicts.
City of Salem Electric	Along Route 635 at Basin 7	Conflict with paved access area to basin.	Relocate pole out of paved area.

**(G) PROPOSED UTILITY IMPACTS**

There are multiple utility impacts between the proposed construction and the existing utility facilities within the Project area. The most significant of these are existing fiber optic lines from Citizen's Telephone Cooperative and VDOT within the I-81 median throughout the Project's length. There are also conflicts between the proposed bridge abutments and existing communications lines at the Route 112 bridge. Additional potential conflicts also exist at several locations within the Project between proposed storm drain pipes and water, sewer, gas, electric, and communications lines. Our Team assessed potential impacts and has a strategy to address each, as summarized above in **EXHIBIT 4.3-10**. Further discussion is provided in *Section 4.4.2*, and a detailed Utility Matrix is available behind "**TAB 2**" in Volume II.

**(H) NOISE BARRIERS**

Per the RFP, our Team will conduct a Final Design Noise Analysis during the detailed design phase, based

on the Department's Preliminary Noise Analysis. If the results of the Final Design Noise Analysis dictate that noise abatement is required, we will provide permanent noise mitigation in compliance with the policies, guidance, and manuals specified in the RFP. The design of any noise barriers will be in accordance with VDOT policies. Our Conceptual Design utilizes small retaining panels at select noise barrier locations to eliminate sliver fill sections. **This will accelerate the construction of the Project, minimize tree clearing, reduce grading and SWM requirements associated with the disturbed area, and reduce ROW impacts.**

**(I) OTHER KEY PROJECT FEATURES**

**■ ITS/CCTV/DMS/Communication Infrastructure**

Major intelligent transportation system (ITS) components will consist of closed-circuit television (CCTV) cameras, equipment cabinets, fiber optic cable system, and network hardware components. Four CCTV sites currently exist within the Project limits. We also propose a new CCTV site at MM 139, on the north side of the Red Lane overpass. We will also provide three

portable CCTVs during construction to monitor traffic along I-81 or other roadways within the regional network following our MOT Plan's approval. Our Team will coordinate this with the VDOT Southwest Regional Transportation Operations Center (TOC) Manager. The fiber optic cable system will include a new 96-count fiber optic backbone along one side of I-81 throughout the I-81 Project limits. Additionally, our Team has included 24-count fiber optic drop cables connecting all existing and proposed ITS devices to the backbone, as defined in the RFP.

Our Team will install the fiber optic cable system in an underground conduit and junction box system, separate from any conduits and junction boxes containing electrical power. The fiber optic cable system will replace existing VDOT and shared resource fiber optic cables impacted by the I-81 Project's construction and provide critical connections to VDOT's TOC and existing fiber optic lines north and south of the Project limits.

We will provide managed field ethernet switches. Our Team will reconfigure existing switches to provide communications through the proposed fiber optic cable system and re-establish communications outside of the project limits. Our Team will coordinate all network hardware configuration requirements with VDOT's networking staff to ensure seamless operation. The inspection, integration, and testing of ITS components will follow a three-tiered sequential process consisting of stand-alone, system operation, and acceptance testing approved by VDOT before starting; this activity will be witnessed by VDOT and the Quality Assurance Manager (QAM) per the RFP requirements.

The ITS will be designed and constructed following *VDOT's Guidelines and Information Instructions, 2020 Road and Bridge Specifications*, and *2016 Road and Bridge Standards* to ensure a system that meets or exceeds the RFP requirements and is maintainable by VDOT. The construction of the proposed ITS components, including fiber optic cable system, will be sequenced with the roadway and bridge construction to minimize disruption to the existing network and system operation. Alternative methods of communications or power for ITS will be provided when disruptions exceed the durations permitted by VDOT.

### ■ Lighting

Our Team will provide roadway lighting at Exit 137, Exit 140, and Exit 141 interchanges per the RFP and Addenda. Following the RFP interchange lighting concepts, the interchange lighting will light all merge and diverge points from mainline I-81 and the entirety of all on- and off-ramps to tie-in with existing lighting at the ramp terminal intersections. Additionally, we will

provide lighting along Route 112 (Exit 137) and Route 311 (Exit 140) to connect with existing lighting along the roadways. The light poles will be standard VDOT LP-1 or LP-2 poles with a maximum mounting height of 45' (our Team will use no high mast lighting) to minimize adverse impacts on nearby residences and areas outside the VDOT ROW.

Our Team will perform photometric and voltage drop calculations to maximize the lighting design's efficiency. We will coordinate with the local utility company to identify locations and construction service drops for the lighting system. The lighting will be designed and constructed following *IES RP-8* and the *VDOT Traffic Engineering Design Manual, Guidelines and Information Instructions, 2020 Road and Bridge Specifications, 2016 Road and Bridge Standards*, and the NEC. This will ensure a lighting system that meets or exceeds the RFP requirements and is maintainable by VDOT.

### ■ Landscaping

Our specialized subconsultant **Land Planning and Design Associates** (LPDA) is well versed in delivering efficient landscaping plans for VDOT, including many D-B projects. Per Section 2.8 of the RFP, all landscaping will follow the *Memo for Guidance for Planting in the Clear Zone and Landscaping for VDOT Projects, Guidelines for Context Sensitive Solutions FHWA 23 CFR 752, Landscaping and Roadside Development*. Planting Sizes and Replacement Plans will be in strict accordance with Section 2.8 of the RFP.

### ■ Signage

Our Team will upgrade, replace, or relocate impacted signage within the project limits in accordance with the RFP. As part of our initial submittal, an existing signing inventory and recommended actions for all existing signs will be provided. Overhead advance guide signage, meeting MUTCD and the Virginia Supplement to the MUTCD requirements for an "intermediate" interchange, will be provided at approximately one-mile and half-mile increments. Our Team will also provide overhead exit direction signage.

Overhead sign structures will be located outside the clear zone or protected by guardrail throughout the project limits. Supplemental guide signs, Integrated Directional Signing Program (IDSP) signage and regulatory/warning signage will be ground-mounted on appropriate VDOT standard sign structures as per the RFP requirements. The proposed signing plan will provide motorists with clear guidance and notice of regulatory and advisory conditions within the project area. Our Team 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.

### 4.3.1.2 Conceptual Structural Plans

Our Team's approach to the I-81 Project provides a solution that meets or exceeds the RFP requirements. The use of reliable and durable materials will result in safe operations, reduced long-term maintenance, increased long-term asset performance, improved constructability, and public acceptance.

#### BRIDGE STRUCTURES

##### ■ General Bridge Design

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.

We are confident that our Team's design and construction abilities will give the Department complete confidence in the I-81 Project's long-term asset performance. Our Team is committed to keeping this confidence throughout the Project through communication, design, detailing, and installation. All materials used on the Project will be in strict accordance with the Department's design guidelines, specifications, and approved materials lists. We will not use any details that increase inspection frequency or require additional inspection effort beyond routine bridge safety inspections.

Besides providing safe, long-term, low-maintenance structures, **our Team's overall approach and proposed bridge designs will minimize the public's impacts and allow construction in a safe and timely manner.** Our Team will design the proposed bridge structure replacements, modifications, and repairs per the *AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017, including Errata and VDOT Modifications*, the RFP requirements, and *Instructional and Informational Memoranda and the Manual of the Structure and Bridge Division*. Bridges will be rated following IIM-S&B-86 and the RFP requirements.

##### ■ Constructability through Design

**Our Team collaborated to extensively evaluate the constructability of the bridge replacements/modification/repairs from a Project corridor perspective.** We reviewed As-Built drawings, survey data, and various alternative roadway alignments to determine this Project's most efficient construction schemes.

Our Team has an established history of working together. Recent examples of how our partnership has successfully produced safe, high quality, long-term, low-maintenance structures for VDOT include the following projects:

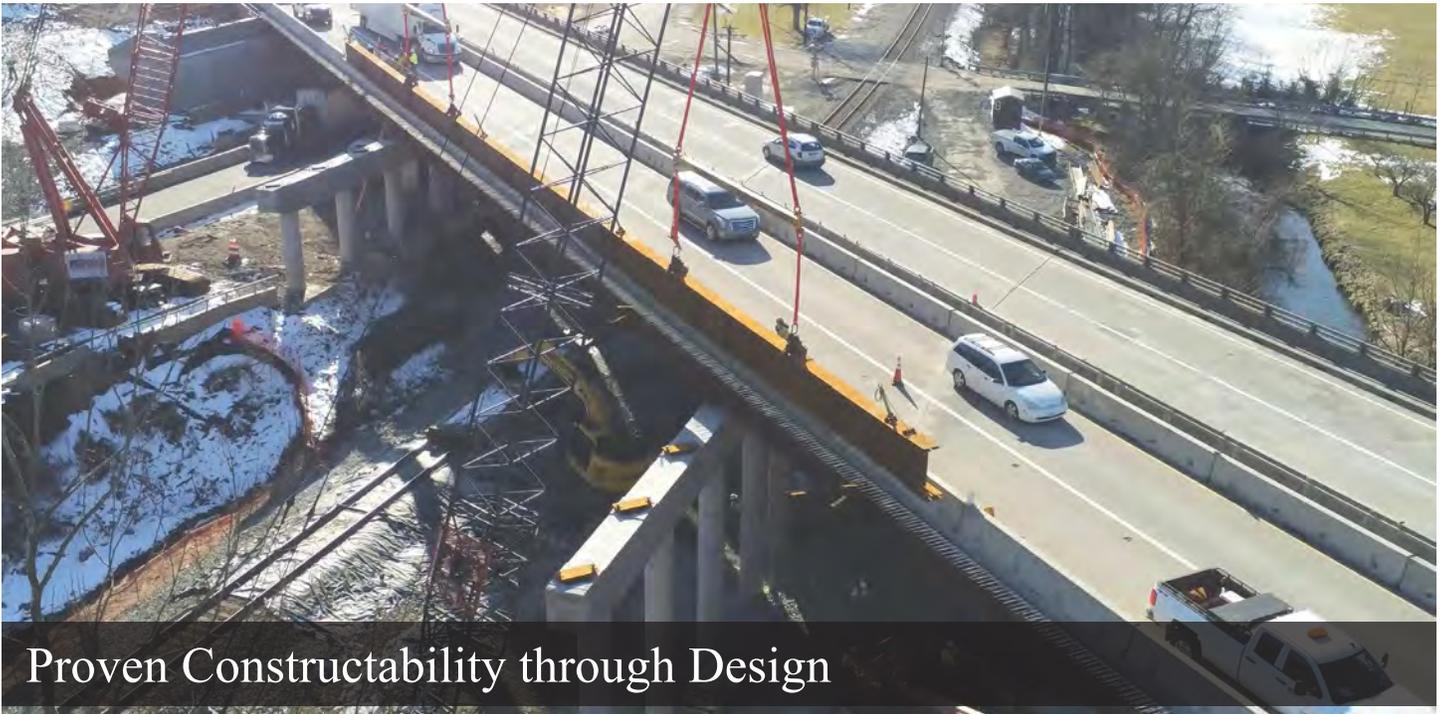
- **Route 636 PPTA | Augusta County, Virginia:** Working with Branch as the Lead Contractor, WRA was the Lead Designer for the Route 636 Extension PPTA. This project included a semi-integral bridge over Norfolk Southern Railway tracks and is very similar to the bridges for this project.
- **I-81 (NB and SB) over Route 808 (Halls Bottom Road) Bridge Replacement D-B | Washington County, Virginia:** Working with Orders as the Lead Contractor, WRA was the Lead Designer for the bridge replacement project. This project replaced the existing structures in staged construction with new structural steel bridges supported by semi-integral abutments in MSE fill and is very similar to the bridges for this project.

We are confident that our proposed sequence **minimizes impacts on the traveling public and provides for each structure's shortest construction duration.** It is of notable mention that for improved motorist safety, our sequence of construction balances construction access with maintaining a minimum of 2' wide shoulders at the bridges at all times, exceeding the minimum RFP requirement of 1' shoulders.

An example of our consideration of constructability is the **use of semi-integral abutments to mitigate risks related to subsurface conditions at each site.** We used knowledge of the area and its geology to determine that the use of integral abutments for the bridge replacements would represent a risk not only to construction cost and schedule but the long-term performance of the abutments. A discussion for each structure for additional information follows in this section.

##### ■ General Superstructure Elements

Our Team evaluated the use of weathering steel girders and prestressed concrete beams and determined that weathering steel offers the best long-term, low-maintenance solutions for each bridge. The weathering steel plate girders also **allow for optimized superstructure depths to provide the required vertical clearances and minimize changes to profile grades throughout the Project corridor.** Smaller cranes with smaller footprints can be used to set the steel girders, which will reduce impacts to the schedule and the traveling



## Proven Constructability through Design

Our Team has an established history of bridge and structure design experience. This experience includes the I-81 Bridge Replacement over the Norfolk Southern Railway, Route 11, and South Fork Holston D-B, on which WRA was the Lead Designer and Orders the Lead Contractor. On this project, WRA worked with Orders to design a bridge that minimized impacts to the traveling public. The above photo shows steel erection during Phase II bridge construction of this D-B project.

public. The ASTM A709 Grade 50W girders will be designed, detailed, and fabricated following VDOT requirements for infinite fatigue life. To complement the durable and low maintenance bridge girders proposed for this project, the reinforced cast-in-place (CIP) concrete deck slabs will be constructed with Low Shrinkage Class A4 Modified concrete and will contain corrosion-resistant reinforcing (CRR) steel as required by VDOT and the technical requirements. Branch-Orders will build the deck to strict adherence to VDOT concrete cover requirements. The resulting deck provides a **very durable long-term low maintenance deck with a high-quality ride surface for the traveling public.**

### ■ Jointless Superstructure for Bridge Replacements

Our Team evaluated VDOT design criteria, including span length, skew, geotechnical requirements, and available geotechnical information. Findings indicate that semi-integral abutments in mechanically stabilized earth (MSE) fills are the best jointless bridge alternative for the new bridges over Route 112, Route 635, and Route 619. After considering subsurface conditions, we determined that achieving the pile arrangement required for fully integral abutments represents an appreciable risk concerning

long-term performance, cost, and schedule. Proper long-term performance of fully integral abutments depends on the flexibility of the pile supports. Accordingly, *Volume V Part 2, File No. 17.01* of the *VDOT Bridge Design Manual* requires that subsurface conditions allow piles to be driven to meet pile bent tolerances. **Semi-integral abutments mitigate pile location and impediment risks associated with fully integral abutments. They also provide an excellent jointless solution following VDOT design criteria.** In accordance with the *VDOT Bridge Design Manual* and relevant experience, we have determined that semi-integral abutments are the appropriate solution. Notably, the bridges will be designed and built to facilitate future jacking operations to replace the elastomeric bearing pads, if necessary, in the distant future.

### ■ Accommodations for Future Widening

Based on experience, our Team has learned that the proposed semi-integral abutments and multi-column piers for the structure replacements are well suited for future widening. The proposed substructure modification on structures carrying I-81 over Route 311 will also not preclude future widening. We evaluated the MSE fill walls proposed for all structure replacements; all walls will be designed and detailed to allow for

future widening of I-81 to accommodate a future four thru-lane configuration. **Our Team has designed and constructed many bridge widening projects and understands how to accommodate future widening.**

Our Team will facilitate future pile installation by installing pile sleeves/cans in the MSE fill below the waterproof geomembrane protecting the MSE fill. Pile sleeves/cans will be filled with approved granular fill material that can readily be removed in the future to install the proposed piles. The location of the sleeves/cans will be clearly marked in construction/As-Built drawings. Additionally, the MSE panels will be designed to take the additional loads induced by future widening and live load surcharge. Contract drawings will clearly document this load allowance for future reference.

### ■ Aesthetics

Our Team will meet all aesthetic requirements of the RFP and the *VDOT Structure & Bridge Manual Part 2, Chapter 5, and Part 3*. For all bridge replacements, the width of proposed parapets accounts for up to 2" relief of drystack architectural treatment on the parapet's exterior faces when not adjacent to a sound barrier while maintaining proper section capacity and reinforcing steel cover for the barrier per VDOT standards. All MSE wall panels and abutment faces at Route 112, Route 635, and Route 619 will receive drystack treatment. Retaining walls and noise barriers will receive architectural treatment in accordance with the RFP.

We will match the current abutment architectural treatment at the abutments on Route 311; details are discussed in greater detail later in this section. All bridge architectural treatments, existing or proposed, will receive a concrete color surface coat. The color of the coating will be coordinated with and ultimately approved by the Department before application. Our Team finds that the proposed weathering steel superstructures combined with the concrete architectural treatments and good clean craftsmanship will visually appeal to the traveling public throughout the extent of the Project.

### ■ 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 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. For example, we evaluated the approach slab/sleeper pad interaction with the median barrier and its impact on joint performance and joint maintenance. We will provide proper joint opening and installation to provide a long service life. An outline

of the design aspects broken down by bridge crossing follows in this section.

## I-81 OVER ROUTE 112

### STRUCTURE LAYOUT

After careful consideration of site conditions, our Team determined replacing the existing four-span structures with two-span structures in two bridge construction phases to be the best option at this location. We evaluated a single-span bridge over the structure obstruction zone, but the required minimum bridge depth to meet VDOT criteria could not provide sufficient vertical clearance without appreciable modifications to I-81 or Route 112 profiles. As shown in **EXHIBIT 4.3-11** on page 18, the proposed bridge **offers more than the required 16' - 6" minimum vertical clearance and allows for a minimum 16' - 6" vertical clearance for a future widening for a four thru-lane configuration with the same girder depth.**

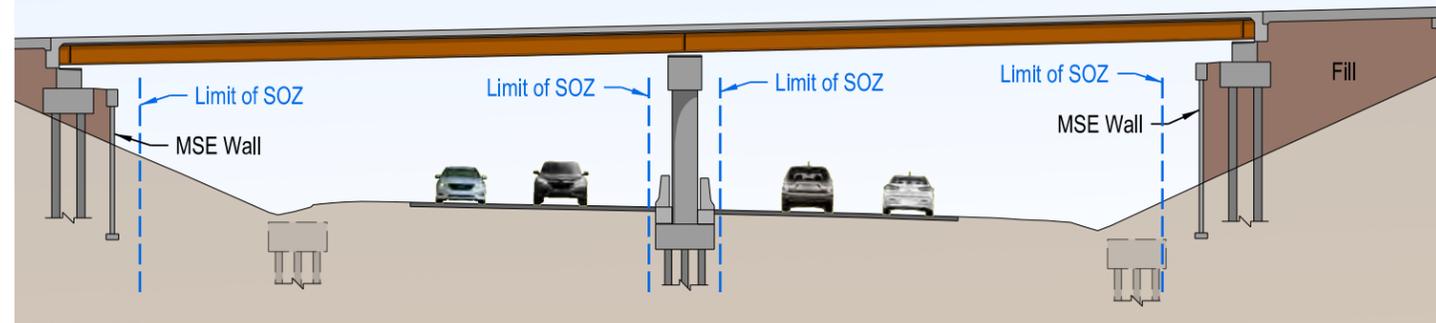
### CONSTRUCTABILITY THROUGH DESIGN

We evaluated the As-Built drawings and survey data to verify that an entire construction phase can be eliminated compared to the RFP plans, which reduces construction duration and associated traffic impacts. A brief explanation of bridge construction activities is provided below. *Section 4.5.1* contains a more detailed writeup and additional information is located in "**TAB 1-B**" in Volume II.

- **Phase 2:** Temporarily shift traffic to the outside to safely maintain traffic in two 11' thru-lanes with 2' shoulders at only the bridge following the RFP.
  - » The exit ramp will be maintained.
  - » The interior portions of the existing NB and SB bridges can be removed. The remaining structure portions will safely support traffic with no reduction in the structure's current load capacity.
  - » This layout works well for deck removal limits relative to the existing beam lines and substructure removal limits relative to existing beams supporting traffic.
- **Phase 3:** Temporarily shift traffic to the newly constructed portion of the structure and maintain two 12' lanes with 2' shoulders at only the bridge following the RFP.
  - » The exit ramp will be maintained.
  - » This configuration provides an appreciable work area in the median of I-81 that achieves separation from the traveling public and facilitates efficient construction. Additionally, this configuration does not require the exit ramp to be maintained on a separate structure from the mainline traffic, as indicated in the RFP Design.

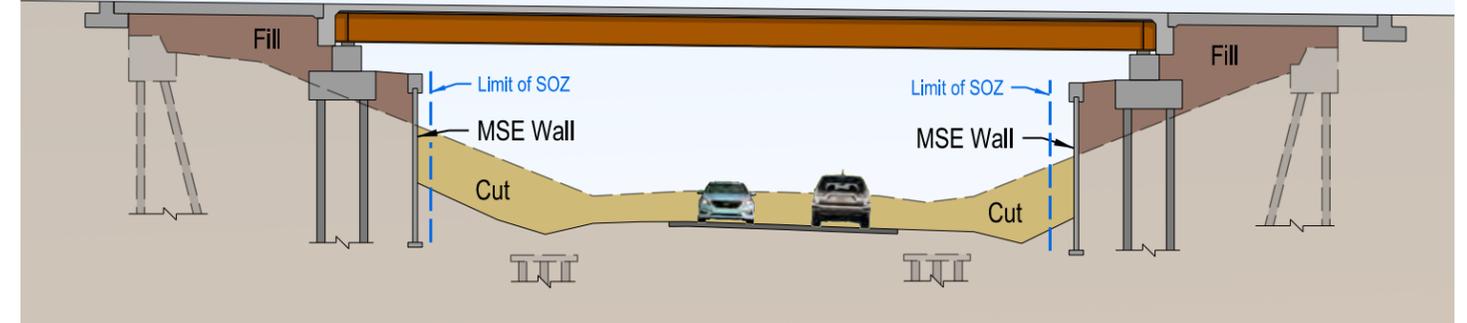
**EXHIBIT 4.3-11** | Bridge Elevation Section Views

## I-81 OVER ROUTE 112



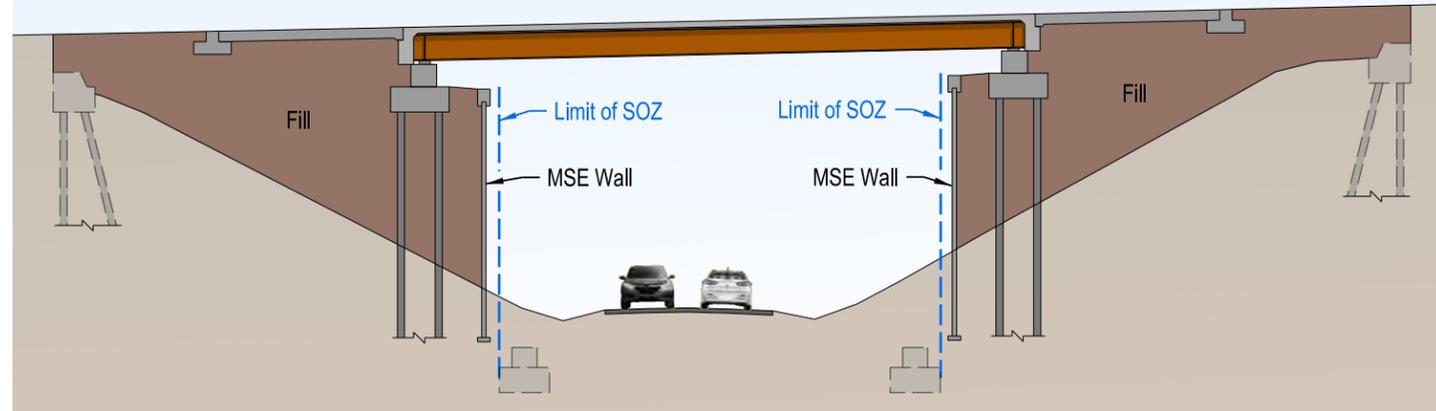
The existing four-span structures will be replaced with two-span structures in two phases and remain outside of the Limit of SOZ. The structural steel superstructures will be founded on multi-column piers and semi-integral abutments. The multi-column pier footing is designed to minimize conflicts with existing pier footings; in no case will any portion of the existing footing be reused. The proposed opening will provide greater than a 16' - 6" minimum vertical clearance and allow for a 16' - 6" minimum vertical clearance in the future widening.

## I-81 OVER ROUTE 635



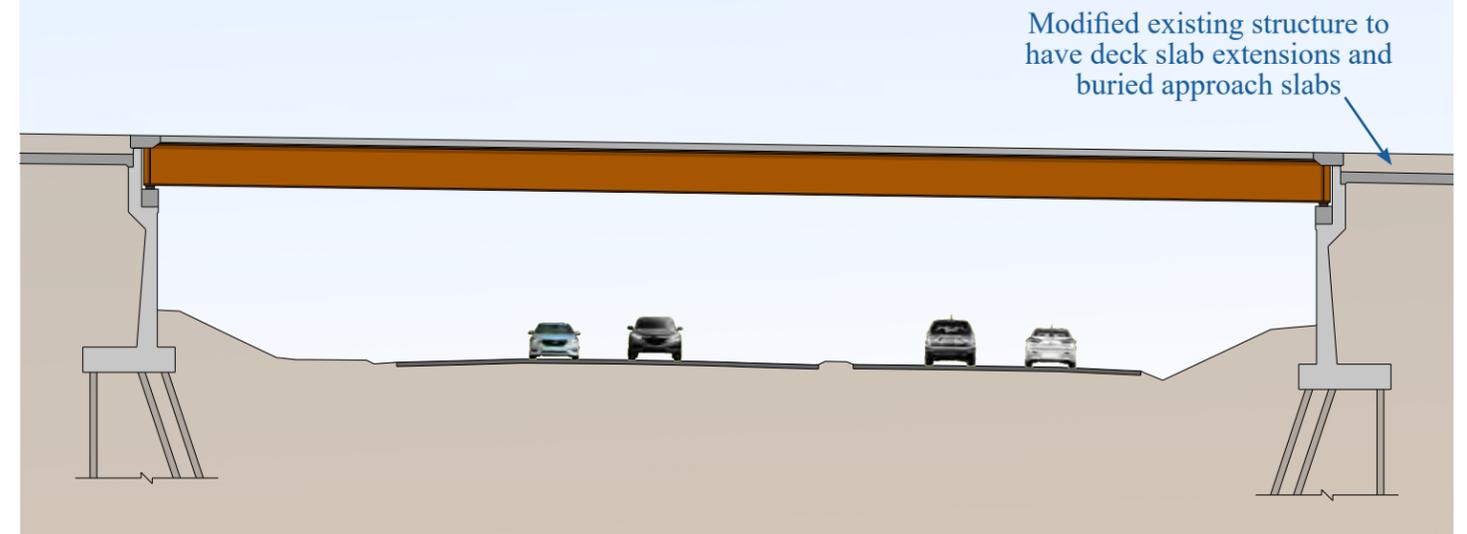
The existing three-span structures will be replaced with single-span structures in two phases and remain outside of the Limit of SOZ. The structural steel superstructures will be founded on semi-integral abutments. The proposed opening will provide greater than a 15' - 8" minimum vertical clearance and will allow for a 15' - 8" minimum vertical clearance in the future widening. This opening will primarily be achieved by lowering the grade of Route 635.

## I-81 OVER ROUTE 619



The existing three-span structures will be replaced with single-span structures in two phases and remain outside of the Limit of SOZ. The structural steel superstructures will be founded on semi-integral abutments. The proposed opening will provide greater than a 16' - 6" minimum vertical clearance and allow for a 16' - 6" minimum vertical clearance in the future widening.

## I-81 OVER ROUTE 311



The existing single-span bridges will be widened in two primary phases of construction. The structural steel superstructures will be widened with structural steel beams. Portions of the remaining deck will receive a latex overlay. The existing median of the abutments will be reconstructed to accommodate the bridge widening. The SB abutments will be widened to the outside to provide the required roadway width. The proposed opening will provide greater than a 16' - 6" minimum vertical clearance and will allow for a 16' - 6" minimum vertical clearance in the future widening.

## SUBSTRUCTURE

Semi-integral abutments will be located behind MSE walls running parallel to Route 112. All portions of the structure will be located outside the structure obstruction zone (SOZ), as indicated in the RFP. MSE wall footers will be located below grade following RFP criteria to facilitate future improvements along Route 112. The proposed pier line will need to be placed where the existing pier is currently located.

Our Team has determined that all proposed multi-column pier footings can be constructed between the existing pier footings in the earlier phase of construction and all but one footing location in the later phase of construction. We do not propose incorporating any portions of the existing foundations into the new structure. Where the proposed footing conflicts with the existing footing, our Team will remove the conflicting portion of the existing abandoned footing and cut existing piles off below the bottom of the proposed footing.

**We propose the use of micropiles in this location to significantly reduce impacts to the traveling public along Route 112.** Equipment required to install micropiles is more compact than the cranes and boom lengths necessary to drive piles in the median of Route 112. Using micropiles significantly improves constructability when working in the median of I-81. We will also install new piles adjacent to existing abandoned piles where proposed pier footings conflict with existing footings.

### I-81 OVER ROUTE 635 AND I-81 OVER ROUTE 619

#### STRUCTURE LAYOUT

After reviewing the site conditions and planned roadway geometry, our Team selected replacing the existing three-span structures with jointless single-span structures spanning the SOZ, as previously shown on page 18 in **EXHIBIT 4.3-11**. **We will perform the bridge replacements in two phases of bridge construction versus the three-phase construction in the RFP Design.**

At I-81 over Route 619, the steel plate girder depth and spacing is optimized to provide the most cost-effective structure for this location. At Route 635, the steel plate girders are optimized to meet the AASHTO and VDOT minimum span to depth ratio to improve the existing substandard vertical clearances. Improving the vertical clearance from 13' - 4" to 15' - 8" at I-81 over Route 635 is a stated goal in the RFP for this location. Notably, a Design Waiver has been obtained to allow the 15' - 8" vertical clearance.

Based on our review of the existing information, including the As-Built bridge plans and the proposed roadway geometry at this location, we have determined that Route 635 can be lowered in phased construction. Our approach to improving the vertical clearance includes:

- Adjust the existing Route 635 roadway to lower the vertical profile at the bridge location to include an allowance for future widening. Based on our review of the bridge As-Built drawings, excavating the existing roadway to this depth will not negatively impact the existing bridge. Our Team will construct temporary drainage and final roadway pavement, except for the finish course of asphalt. This effort will be accomplished during the allowable 60-day closure of Route 635, while school is not in session.
- Our Team will construct the bridge replacements utilizing two-phase construction. We will demolish the existing bridge piers during the bridge replacement to not damage the previously constructed Route 635 roadway. We will perform finish grading and construct surface course pavement and lane striping utilizing a flagger operation to maintain traffic.
- Jointless superstructures will be supported on semi-integral abutments located behind MSE walls running roughly parallel to the roadway alignment of the routes being crossed. All portions of the structure will be located outside of SOZs, as per the RFP. MSE wall footings will be embedded following the RFP criteria to facilitate future improvements along Route 635 and Route 619.

#### CONSTRUCTABILITY THROUGH DESIGN

As an improvement to the RFP Design, our Conceptual Design replaces the existing bridges in two phases of construction at each location versus the three phases shown in the RFP Design as follows; additional information is located behind "**TAB 1-B**" in Volume II. *Section 4.5.1* contains a more detailed writeup.

- **Phase 2:** Traffic will be temporarily shifted to the outside (away from the median) of the existing bridges and will be accommodated in two 11' lanes with 2' shoulders. The bridge's NB and SB interior portions will be demolished and reconstructed on their new alignments with sufficient width to provide two 12' lanes with 2' shoulders in each direction at Route 635 and two 11' lanes with 2' shoulders in each direction at Route 619.
- **Phase 3:** Traffic will be shifted to the newly constructed inside portion of the NB and SB bridges. When traffic is shifted, the remaining outside portion of the NB and SB bridges will be constructed, and the bridges will be fully opened to traffic.

This construction sequence works well for deck removal limits relative to the existing beam lines and substructure removal limits relative to existing beams in conjunction with our proposed roadway alignments. The existing structures can be partially demolished and still safely support traffic on the remaining portion of the existing structure with no reduction in its current load capacity.

This configuration also provides an appreciable work area in the median of I-81 that achieves a safe separation from the traveling public and facilitates efficient construction while reducing the number of construction phases and meeting all RFP requirements.

### ROUTE 705 OVER I-81 AND ROUTE 419 OVER I-81

In accordance with the RFP, these structures will receive concrete substructure repairs, which shall include installing anodes in the repair areas according to the Specifications. All repairs will be in accordance with the RFP and *Volume V, Part II, Chapter 32*. Pier neatwork repairs will be waterproofed following the *VDOT Special Provision Copy Note for Waterproofing Coating* and the Specifications.

Existing piers will be protected by pier protection designed and installed following VDOT requirements. Additionally, our Team will repair the concrete slope protection at Route 419 by removing damaged portions, restoring fill, and restoring in-kind. All work will be performed in coordination with the roadway sequencing to reduce impacts to the traveling public.

### I-81 OVER ROUTE 311

#### STRUCTURE LAYOUT

As previously shown in **EXHIBIT 4.3-11** on page 18, the existing structures will be widened to the inside and outside with structural steel beams supported on reconstructed or extended portions of the abutments. Proposed locations of widening and sequence of construction are in-keeping with RFP Design. The proposed widening can be achieved with steel beams that meet VDOT required minimum span to depth ratio based on all available information.

The steep grade of Route 311 would preclude maintaining 16' - 6" in a four thru-lane configuration on the SB structure if the same girder depth were used. If necessary, our Team will install all substructure modifications with sufficient depth to facilitate lowering Route 311 in the future. It is noted that a Design Waiver to reduce the girder depth could be used for the future four thru-lane configuration instead of lowering the Route 311 roadway profile.

#### CONSTRUCTABILITY THROUGH DESIGN

Similar to RFP Design, our Team evaluated As-Built drawings and survey data to verify that traffic can temporarily be shifted to the outside to safely maintain traffic while providing 2' shoulders within the existing bridge footprint per the RFP. The interior parapet and deck overhangs of the NB and SB bridges will be removed, and the bridges will be widened to the interior on reconstructed abutments.

After construction in the median, traffic will temporarily be shifted to the inside to safely maintain traffic. The exterior parapet and deck overhangs of the NB and SB bridges will be removed, and the bridges will be widened to the exteriors. The SB bridge will be widened on new girders supported by abutment extensions. The NB structure will not require added girders for the widening to the outside. The bridge widening will be supported on existing bridge girders with an extended deck overhang meeting the design waiver for overhang length at this location. Additional information is located behind "**TAB 1-B**" of Volume II.

#### SUPERSTRUCTURE

Upon reviewing As-Built drawings, our Team noted that the existing bridge deck has precast stay-in-place panels. We considered these forms' presence when evaluating the RFP Design and constructability of the proposed widening.

To adequately address the stay-in-place panel's presence to remain in the finished condition, our Team will replace the existing overhang on the east face of the NB bridge as shown in the RFP Design; we will also replace the full deck in the exterior bay. This method will allow our Team to eliminate the risk of removing a portion of the deck over the precast panels that would have to remain. It will also enable the ability to fully develop the proposed parapet reinforcement in accordance with the standards. Our Conceptual Design sets the limits of removal and reconstruction to be located over the existing girders. In no case will partial portions of the precast panels remain in the structure.

In addition to widening the bridge, bridge joints will be eliminated to provide a jointless bridge deck. This structure has approach slabs supported by the back wall. Therefore, the approach slab will be replaced with a buried approach slab supported on a modified backwall to allow for the installation of deck slab extensions. **The deck slab extensions will eliminate the joints following the VDOT Structure and Bridge Manual for existing portions of the bridge to remain in widened portions.** The new approach slabs and the deck slab extensions will provide a long-term, low-maintenance jointless superstructure.

Proposed girders are designed to prevent any increase in loading to the existing exterior beam and ensure that the existing beam will provide a similar service life to an existing interior beam. Additionally, all widened portions of the structure will provide a relative overall structure stiffness that works well with the remaining portion of the bridge and ensure that the final superstructure shares applied loads well. Doing so will prevent such issues as unanticipated diaphragm or deck stress at the construction joints.

The deck will receive a mill and overlay over all portions of the existing deck that remain. Traffic will be shifted to minimize the number of construction joints in the overlay. All construction joints will be prepared and installed according to VDOT requirements to ensure the overlay provides the required service life. Our Team will replace the existing bearings. As the proposed elastomeric bearings are much shallower than the existing bearings, we will install seat extensions to raise the existing beam seats.

### SUBSTRUCTURE

In accordance with the RFP, the existing abutment piles cannot be used to support widening to the median unless the pile condition and capacity are verified. The existing front piles are battered and cannot be re-struck from in front of the abutment. Re-striking will require the median's excavation to expose the heel and removal of a large portion of the heel to expose three piles. We will replace the entire median portion of the abutment and anticipate driving new piles as the entire area will already be exposed. Existing SB abutments will be extended to the west with a seat extension and u-back wingwall supported on H-piles. The existing wingwall will be removed to a minimum of 3' below grade. The small widening to the east of the NB bridge will be accommodated by modifying the top portion of the wingwall; a moment slab will be installed above the portion of the existing wingwall to remain.

### APPROACH SETTLEMENT

As outlined in the RFP and as documented in the most recent *Bridge Safety Inspection Report*, the drainage apron in the outside shoulder of the SB I-81 just north of the abutment has settled 5 ½" and is undermined by approximately 4' x 2' x 3' deep. This drainage apron and existing approach slabs will be replaced with new approach slabs. When the drainage apron is removed, the fill will be evaluated to determine that the settlement is isolated to the existing drainage apron area. Any unsuitable material will be removed, and our Team will install select approach backfill material according to VDOT requirements before installing the proposed approach slabs.

### ■ Temporary Shoring

Phased construction will require the use of temporary walls to facilitate construction. Temporary support of the excavation will be required to enable excavation adjacent to the existing travel way. Additionally, the first phase of MSE wall will incorporate temporary wire walls parallel to I-81 to temporarily support the first phase of bridge construction until it is ultimately abandoned in the final MSE fill.

### ■ Retaining Walls

Retaining walls are required at various locations throughout the project to minimize ROW impacts. All retaining walls on the project will be in accordance with the RFP and *Volume V, Part 11, Chapter 10*. Retaining walls will have HR-1 railings where required by the RFP. Where relatively small amounts of soil retention are required at noise barrier, soil retaining panels will be utilized to eliminate the need to construct or maintain separate retaining walls. Our Team will analyze any existing earth retaining structures for any increase in soil loading.

### ■ Major Drainage Structures

Our Team will evaluate all major drainage structures for any increase in applied loading due to the roadway widening. We have determined that the existing box culvert structures at SB STA 549+10 (6' x 4' cell) and 560+20 (4' x 6' cell) will be modified. Culvert extensions will be designed and detailed in accordance with VDOT standards to match existing hydraulic openings. Construction joints between existing box culverts and proposed extensions will be detailed, executed, and waterproofed to provide a long-term, low-maintenance extension. Headwall and wingwall modifications will be made where culvert extensions can be eliminated. These will be designed and detailed in accordance with VDOT practices. Drainage structures will be repaired in accordance with the RFP.



# SECTION 4.4

## Project Approach

## 4.4 PROJECT APPROACH

WE OFFER A TEAM CENTERED AROUND PARTNERSHIP, AND ARE READY TO ACTIVELY ENGAGE WITH VDOT TO DELIVER THIS D-B PROJECT. SUCCESS REQUIRES TRUST AND INTEGRATION BETWEEN AN EXPERIENCED TEAM, VDOT, AND MULTIPLE STAKEHOLDERS. WE WILL MAKE COMMUNICATION A PRIORITY AND SUPPLY THE RIGHT TECHNICAL RESOURCES AT THE RIGHT TIME.

The Branch-Orders Team is committed to being a true partner, knows how to manage complex projects, and can manage risk through best practices and lessons learned from similar large-scale major roadway and bridge improvement projects. Members of our Team have applied the systems, tools, processes, and procedures described in this section on previous D-B projects, including the I-95 Southern Terminus Extension (STE) D-B, I-64 Widening Exits 200 to 205 D-B, and I-81 Halls Bottom Bridge Replacement D-B.

### Project Management Approach

Our Team will leverage its proven history of managing complex D-B projects, public relations, and coordinating with multiple stakeholders to implement best practices throughout the delivery of the I-81 Project. By partnering with VDOT and other stakeholders, we will effectively manage all aspects of design and construction to limit impacts throughout the Project's life. Elements our project management approach are highlighted in **EXHIBIT 4.4-1**.

### OVERALL PROJECT MANAGEMENT

**M. Jeff Humphreys, Jr., DBIA**, will serve as the D-B Project Manager (DBPM) and will have ultimate responsibility for the Project's delivery. Mr. Humphreys has **more than 40 years of experience** and serves as a knowledgeable and conscientious project manager with a knack for public interaction and exceeding the expectations of project owners. As an added value, we have included **Pat Jones** as the Deputy DBPM. With **more than 20 years of construction experience**, Mr. Jones will support the project management role and assist Mr. Humphreys with leading the Team.

### EXECUTIVE COMMITTEE

Providing VDOT with an additional accountability level is our Team's Executive Committee, a best practice learned from previous major D-B projects. The Executive Committee will work with the DBPM to fulfill project objectives and commitments to VDOT and critical stakeholders. The Executive Committee comprises **senior leadership from all major Team member organizations** and provides ultimate authority to manage resources and mitigate risk, providing delivery certainty.

#### **EXHIBIT 4.4-1** | Project Management Approach



*Integration of safety and constructability into the design.*

*Consideration of schedule and cost implications.*



*Improved coordination with VDOT and all relevant stakeholders in the I-81 Project corridor.*

*Improved efficiency and elimination of surprises.*



*Attention to all design alternatives, access, equipment, and material resources.*

*Reduced field design changes during construction of the I-81 Project.*



*Consistency in approach, standards, and regulations during design.*

The members of the Executive Committee include:

- **Jason Hoyle** (Vice President – Branch)
- **Nate Orders, PE** (President – Orders)
- **John Maddox, PE** (Senior Vice President – WRA)
- **Owen Peery, PE** (Director, Transportation – RK&K)

With extensive experience and knowledge of D-B processes, these individuals will track and review project

## TEAM MEMBER HIGHLIGHT: Design-Build Project Manager

Mr. Humphreys has more than 40 years of project management experience and has worked as DBPM on many highway and bridge projects. He excels in bringing a variety of D-B and transportation projects to completion on time and within budget. He served as the DBPM on I-64 Widening Exit 200 to 205 D-B Project in New Kent and Henrico Counties. Very similar to the I-81 Project, this challenging interstate widening project widened the roadway from four to six lanes, widened two existing bridges over the Chickahominy River, and rehabilitated existing structures to accommodate additional lanes. The project faced extreme weather conditions, including heavy flooding that impacted bridge construction. Despite these challenges, Mr. Humphreys led the team to an early completion, earning the maximum incentive bonus from VDOT. Client accolades received from VDOT are shown below.



*M. Jeff Humphreys, Jr., DBIA  
Branch Civil, Inc.*

*"Despite higher than normal river levels, which affected your substructure work on the bridge, pushing the project weeks behind the baseline schedule and the addition of soundwall square footage, Branch kept focused on completing the project within the original schedule. You led the project toward safety and quality while actively partnering with the Department. I appreciate your commitment to the project and look forward to working with you on future projects."*

*Shane Mann, PE  
District Construction Engineer  
VDOT Richmond District*

performance with the Management Team to ensure necessary resources, including design and construction personnel, equipment, and materials, are allocated to safely and efficiently complete the project. They will also review and provide direction to the Team on how to best address issues regarding safety, quality, and the environment, should they occur.

### PUBLIC RELATIONS MANAGER

Clear communication and effective outreach with the VDOT Salem District is critical to engaging the public. Our Team will partner with VDOT to develop comprehensive public communication and community engagement program to achieve this goal. The DBPM will lead all design and construction-related public communications and will be assisted by our Team's Public Relations Manager, **Owen Peery, PE**.

Mr. Peery has **extensive experience working as an outreach manager in Virginia** and is familiar with VDOT's public relations processes and VDOT's *Policy Manual for Public Participation in Transportation Projects*. Mr. Peery and the DBPM will work with VDOT's Salem District Communications Team and the VDOT Southwest Regional Transportation Operations Center (TOC) to notify the traveling public of project impacts, including lane shifts and closures. Detailed information about our plan to keep the traveling public aware of this critical Project's construction is provided in *Section 4.5.2 Transportation Management Plan*.

### PARTNERING APPROACH

Our Team will implement a detailed partnering approach with VDOT from the beginning of the I-81 Project. Elements of this approach include:

- Keeping the public and stakeholders well-informed and safe at all times. The Team's approach identifies critical safety concerns during the design phase, which will help eliminate hazards during construction.
- Holding detailed partnering meetings, which include, but are not limited to, quarterly partnering meetings, over-the-shoulder reviews, task meetings, traffic management task force (TMTF), and quality assurance and quality control (QA/QC) meetings.
- Creating an environment where stakeholders can provide input to the design and construction process, maintaining the Project's integrity, and all parties' interests are represented. The public will have the opportunity to discuss key concerns throughout the I-81 Project's duration.

### COORDINATION MEETINGS

Continuous communication on all levels is the foundation of our integration. Our Team will implement a series of coordination meetings, which are presented in **EXHIBIT 4.4-2** on page 24.

#### 4.4.1 Environmental Management

Our comprehensive **Environmental Management Plan (EMP)** outlines environmental goals, ensures the satisfaction of permit requirements, and addresses schedule requirements for permitting and environmental compliance. It institutes robust compliance, monitoring, reporting, and continuous improvement of our Team's processes. The EMP focuses on avoiding and reducing environmental impacts during design and construction by establishing proven procedures to address environmental issues, provide mitigations, and minimize risk.

**EXHIBIT 4.4-2** | Coordination Meetings

MEETING (FREQUENCY)	DETAILS/PURPOSE
<b>Task Forces</b> (Weekly during Design)	<ul style="list-style-type: none"> <li>Streamlines decision-making and design development process through discipline-specific, face-to-face collaboration.</li> <li>Explores opportunities to mitigate risk and minimize impacts to the public through design innovations.</li> <li>Evaluates safety, quality, design updates, environmental and sustainability opportunities, constructability, schedule, utilities, and ROW.</li> </ul>
<b>TMTF Meetings</b> (Monthly)	<ul style="list-style-type: none"> <li>Reviews current and upcoming MOT plans and activities to help coordinate operations with the Team, VDOT, stakeholders, the adjacent projects, and the public.</li> <li>Evaluates safety and schedule to minimize impacts.</li> </ul>
<b>Progress and Health, Safety and Environmental (HSE) Meeting</b> (Monthly)	<ul style="list-style-type: none"> <li>Facilitated by the DBPM.</li> <li>Team reviews action items and updates of all aspects of the project ranging from safety, design, environmental compliance, construction, schedule, public relations, utilities, and ROW coordination.</li> </ul>
<b>Preparatory Meeting</b> (Prior to Each Operation)	<ul style="list-style-type: none"> <li>Held before the start of every major work activity.</li> <li>Reviews the plan for construction of the work so that the team is clear on scope, safety, quality, and environmental compliance.</li> </ul>
<b>QA/QC Meeting</b> (Weekly)	<ul style="list-style-type: none"> <li>Reviews safety, quality, environmental compliance, QA/QC, schedules, upcoming activities, and required communication.</li> <li>Effectively keeps all parties informed of the Project’s status and actively engaged.</li> </ul>
<b>Safety Meeting</b> (Weekly)	<ul style="list-style-type: none"> <li>Communicates safety trends and related messages from Corporate to the operations team.</li> <li>Provides job-specific update to the operations team.</li> </ul>
<b>Safety Meeting</b> (Daily)	<ul style="list-style-type: none"> <li>Reviews that day’s tasks and associated safety risk assessments between superintendents and their crews.</li> </ul>
<b>Design Integration Meeting</b> (Bi-Weekly)	<ul style="list-style-type: none"> <li>A focused meeting of key stakeholders and experts to discuss the design.</li> </ul>
<b>Constructability Review Meeting</b> (Bi-Weekly)	<ul style="list-style-type: none"> <li>These meetings will occur during the pre-construction phase.</li> <li>Will be attended by design and construction personnel to review project constructability and provide input on the design.</li> </ul>
<b>Stakeholder Meetings</b> (As Needed)	<ul style="list-style-type: none"> <li>These meetings make certain that constant engagement of stakeholders.</li> </ul>
<b>Public Meetings</b> (As Needed)	<ul style="list-style-type: none"> <li>The meetings achieve engagement with the public and that their concerns and issues are addressed throughout the project life cycle. This includes “pardon our dust” meetings.</li> </ul>

## APPROACH TO ENVIRONMENTAL PERMITTING DURING DESIGN AND CONSTRUCTION

### ■ Design Approach

Identifying recognized environmental conditions/areas of concern early in the design process facilitates the timely issuance of environmental permits. Additionally, consistent communication within our Team and resource agencies helps mitigate risk to the I-81 Project Schedule.

Our approach during design includes 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 Conceptual Design. We will conduct fieldwork and technical services as necessary. They may include wetland delineation reconfirmation, stream assessments, threatened and endangered (T&E) species reviews, environmentally sensitive areas (ESAs), asbestos inspections on structures, and a final noise analysis that will be utilized for permitting and environmental compliance monitoring.

If our refinement identifies unanticipated or unknown resources, the Conceptual Design will be modified to support avoidance and/or minimization opportunities. Our Team will coordinate with the appropriate resource agency(ies) to ensure resource protection if any new resources are 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 Conceptual Design is entirely within the RFP Design's footprint, the previously concluded Section 106 effect determination of No Effect, determined on July 28, 2020, should remain valid. Per the RFP, our Team will consider the three identified historic properties along the project limits to be design constraints and will avoid impacting them beyond what is included in the RFP Design. These properties include the Virginia Baptist Children’s Home/Hope Tree, Hanging Rock



## WRA's Environmental Team

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. It will also assist in identifying and securing the permits and environmental commitments required to ensure success on the I-81 Project.



Battlefield, and Freeman Cemetery. **We will avoid any other Project-related activities on or within the viewshed of the three historic properties identified in the RFP, including but not limited to staging, borrow/disposal, and any temporary or permanent easements.** We understand that any changes beyond the RFP Design may require additional cultural resources studies or coordination with the Virginia State Historic Preservation Office (SHPO).

### 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 August 21, 2020, identified two species that the Project would have no effect: the Roanoke logperch and orangefin madtom. This Form stated that the proposed Project may affect, but is not likely to adversely affect, the Indiana bat and northern long-eared bat. However, VDOT's June 2020 acoustic survey for T&E bats did not detect the presence of Indiana bat or northern long-eared bat. Additionally, the survey report concluded that a time-of-year restriction for tree cutting will not be required for the Project as long as all tree cutting occurs during the five-year time frame the survey is valid.

Per the RFP, no bridge bat inventories will be required within the five-year time frame the acoustic survey is valid. 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

Our Team refined the RFP Design to avoid and minimize impacts to streams. The RFP Design resulted in impacts to 0.31 acres (AC) of wetlands and 1,120 LF feet of streams. **Our Conceptual Design was refined to avoid impacts to 25 LF of streams through headwall modification.** This modification also eliminates floodplain impacts for the Project. As the design advances following the receipt of an NTP, we will look for additional ways to improve our Conceptual Design to avoid and further reduce impacts.

The Project will require authorization under a Virginia Water Protection General Permit 3 (up to 1,500 LF and 2 acres of wetlands) and an Individual Permit from the US Army Corps of Engineers (USACE). **If impacts can be reduced to less than 0.5 acres of wetlands and 1,000 LF of streams, the Project would be authorized under a Nationwide Permit 23 for approved Categorical Exclusions.** The Project will cross four named streams: Horners Branch, Dry Creek, Gish Branch, and Mason Creek. Mason Creek has a drainage area greater than 5 square miles; therefore, a Virginia Marine Resources Commission (VMRC) permit will be necessary.

If required, impacts to wetlands and streams will be mitigated through the purchase of wetland and stream credits from approved mitigation banks. During construction, if permit modifications are required, we will avoid increasing wetland and stream impacts and impacts to the

Project's schedule to the maximum extent practicable. The Project will not encroach into and will not impact the 100-year floodplain. During the development of the Final Design, the Team will conduct a hydrologic and hydraulic analysis. This analysis will ensure the adequate design of the hydraulic openings of culverts and bridges, allowing proper conveyance of floodwaters to minimize potential impacts on floodplain and floodplain hazards. The Final Design will ensure that no substantial increase in downstream flooding occurs and document the need for any Letters of Map Revision (LOMR) or Conditional Letters of Map Revision (CLOMR). It will also ensure that all encroachments conform with all applicable state and local floodplain protection standards.

### ■ Communication Methods

Consistent communication, both within the Team and with resource agencies, is crucial for maintaining the Project Schedule. Our Team will use the following communication methods throughout the design and construction of the I-81 Project.

### CREATING AN ENVIRONMENTAL CONSTRAINTS MAP

Upon receipt of an NTP, our Team will create an Environmental Constraints Map that depicts any environmental constraints' locations. This living document will be distributed to all Team members so that we can design and construct around areas of environmental concern.

### REGULAR COORDINATION MEETINGS

We will set up regular coordination meetings between design and construction personnel. These meetings will provide an opportunity to discuss and understand environmental constraints and ensure all disciplines address them. We will also discuss opportunities to discuss anticipated permit requirements and facilitate avoidance and minimization efforts during meetings. In addition to formal coordination meetings, the Team's environmental staff will work closely with design engineers to ensure environmental constraints are recognized throughout the design process and construction means and methods are understood in the permitting process. This communication eliminates rework during later stages of design and avoids potential permit modifications.

### REGULATORY AGENCY PRE-APPLICATION COORDINATION

Our Team will coordinate to review impact limits with the appropriate regulatory agencies before submitting permit applications to ensure their completion. This approach expedites the permitting process by allowing each agency the opportunity to review, comment, and provide recommendations on the impacts before permit application submittal.

### ■ Environmental Approach during Construction

Our Team understands 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 has 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 Project. These inspections will cover all aspects of the Project, including staging areas, waste areas, and haul routes. Additionally, we will have a QA inspector dedicated to performing and documenting the required environmental inspections and corrective work. This dedicated QA inspector 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).

Before and immediately following storm events, our erosion control crew will utilize an **All Hands on Deck approach** to the inspection and maintenance of E&SC devices. Additionally, we will establish a chain of responsibility for the Team's and subcontractor's operations to ensure the E&SC Plan and SWPPP are implemented and maintained over the life of the contract. As part of the Preparatory Meeting, Construction Manager, **Bob Cross**, and Environmental/Permits Lead, **Taylor Sprenkle, PWD**, will lead environmental compliance meetings before beginning work in ESAs to ensure permit requirements are followed. Also, VDOT and other appropriate agencies will 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 subsequently delineate wetlands and streams to be avoided with orange safety fencing and signage to prevent accidental encroachment into these ESAs. Proper construction methodology and processes when working within ESAs are critical to Project 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.** As examples, tree clearing will be limited to the amount necessary to perform the work, temporary work within wetlands will be performed on mats, and non-erodible material will be used for temporary stream crossings. 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 elements of our Team's approach to achieving environmental protection and compliance.

### CONSTRUCTION ENVIRONMENTAL MANAGER

We will take a proactive approach to environmental compliance to **identify and mitigate potential problems before they become violations.** The Construction Team includes an Environmental Compliance Manager (ECM) who reports directly to the DBPM and has the authority to stop work. Once construction begins, the ECM will collaborate with and support the construction staff to meet environmental commitments. The ECM will also advise the field construction staff of any issues or construction activities that may impact environmental permits.

### PRE-CONSTRUCTION COORDINATION

Before construction, we will use the Environmental Constraints Map as a tool for confirming and avoiding areas of concern. Our Team will clearly demarcate all Waters of the US (WOUS) to **make certain that boundaries are easily identifiable by construction staff.** Non-impacted wetlands and WOUS will be protected by a silt fence and orange safety fence to avoid non-permitted areas. Additionally we will conduct environmental compliance training to educate construction staff on the project's ESAs and methods to prevent and minimize impacts to ESAs.

### 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. The QAM's staff will perform and document the official C-107 reviews twice per week as required. C-107 reviews will be completed twice a week. We will provide prompt updates to VDOT regarding the status of any items identified during inspections, and we will implement corrective actions promptly. Furthermore, we will conduct internal reviews to ensure all documentation is updated and maintained.



### ENVIRONMENTAL COMPLIANCE TRAINING

WRA's environmental and construction 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 I-64 Widening Exits 200 to 205 D-B and the I-81 Bridge Replacements in Atkins, VA.



The Geotechnical Data Report (GDR) provided in the RFP identified the presence of low-sulfur (<0.2%), Category 2 Acid Producing Material (APM) within the project limits. Our Team understands that the key to mitigating APM is locating and assessing it before it is exposed. Our Team will perform a design-level geotechnical exploration that will include APM field exploration, laboratory testing, and Acid Based Accounting (ABA) analysis to identify, locate, and assess any additional APM within the Project limits.

**Our Team will develop avoidance measures, design features, and mitigation measures to ensure that any acidic drainage is controlled, mitigated, and treated to ensure no long-term performance issues related to the vegetation and surface water runoff from the Project.** These findings and mitigation measures will be incorporated into the Geotechnical Engineering Report (GER) and provided to VDOT for review and discussion. Our Team will develop an APM Management Plan to outline procedures for the following:

- Monitoring vegetation and water quality.
- Managing or treating surface water to ensure a pH of between six and nine.
- Treatment of cut slopes that may contain APM.
- Management of APM to be used as fill or transported off-site to approved disposal facilities.
- Classification of APM into one of four categories.

**EXHIBIT 4.4-3** | Approach and Solutions for Environmental Concerns/AOCs in the Project Footprint

ITEM/CONCERN	AVOIDANCE, MINIMIZATION, AND MITIGATION STRATEGY
Presence of Nesting Migratory Birds under Bridges	<ul style="list-style-type: none"> <li>Proactively attach exclusion barriers before breeding season.</li> <li>Conduct daily inspections during breeding season to remove nests before eggs are laid.</li> </ul>
Hanging Rock Battlefield Trail	<ul style="list-style-type: none"> <li>Keep the trail at all times open during construction.</li> <li>Provide effective public outreach.</li> <li>Coordinate with Roanoke County Parks and Recreation Department.</li> <li>Design BMP maintenance access to avoid conflict with the trail.</li> </ul>
Hazardous Materials	<ul style="list-style-type: none"> <li>Conduct the Phase II needed for four sites as early as possible.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Conduct final noise analysis.</li> <li>Design the walls so that they minimize impacts.</li> </ul>
Air Quality	<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 of the project</li> <li>Reduce dust to businesses and residential sites.</li> </ul>
Cultural Resource Sites	<ul style="list-style-type: none"> <li>Avoid impacts to the viewshed of the three identified historic properties.</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Expand the stormwater basin to improve erosion protection and water quality treatment.</li> </ul>
Acid-Producing Materials	<ul style="list-style-type: none"> <li>Avoidance by roadway alignments and the use of retaining walls.</li> <li>Elements are further defined in <i>Section 4.4.3 Geotechnical</i>.</li> </ul>

Our Team will identify potential materials that could be used to treat the onsite APM. For example, Category 4 materials within the Project limits could be blended with low-sulfur Category 2 materials to achieve a Neutralization Potential Ratio (NPR) greater than three. If suitable material is not identified within the Project limits, off-site clean fill could be brought to the project, or the APM could be hauled to an appropriate disposal facility.

**Approach and Solutions Areas of Concern**

As shown above in **EXHIBIT 4.4-3**, the Team has identified Environmental Conditions/Areas of Concern (AOC) within the I-81 Project’s footprint, analyzed the risk to that environmental condition/AOC, and identified avoidance and mitigation strategies to avoid adverse effects to the environment condition/AOCs.

**Schedule Integration with Environmental Milestones**

Because construction cannot start until the permits are issued, obtaining environmental permits and environmental approvals promptly is always a schedule and planning priority for any project. As demonstrated in our Proposal Schedule, provided behind **"TAB 3"** in Volume II, our Team has already integrated key environmental permits, hold points, and approval activities into the Project Schedule.

**4.4.2 UTILITIES**

There are numerous potential utility conflicts 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 Technical Proposal development, our Team conducted an in-depth utility conflict analysis and initiated coordination with all



**WRA's Utility Team**

Utility coordination, adjustments, and relocations are always a major concern on roadway improvement projects. Because of the large volume of impacted utilities, our Team understands that a successful approach to utility coordination and relocations is critical to the success of the I-81 Project. WRA's Utility Team includes staff with years of experience with all utility owners in the I-81 Project corridor.

relevant utility owners to fully understand the existing utility landscape and develop a plan to mitigate potential conflicts. Our efforts allow us to present a construction scheme that will **successfully coordinate, avoid, protect, or relocate utilities in accordance with all RFP and Contract requirements.**

**EXPERIENCE WORKING WITH SIMILAR UTILITY OWNERS**

With three completed and two active D-B projects underway, **WRA’s Utility Coordination Team is very experienced working on VDOT D-B projects.** WRA’s utility staff have performed utility coordination

with many utility companies in the past, including Appalachian Power, Dominion Energy, Verizon, Cox, Western Virginia Water Authority, City of Salem, Comcast, Cox, Crown Castle, Lumos, Segra, Summit IG, Uniti Fiber, Verizon, Windstream, and Zayo.

### APPROACH FOR 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 in **EXHIBIT 4.4-5**, we will use an active approach to the 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 ensure that an emphasis is placed on hands-on coordination throughout the life of the Project.** This is the most effective method for keeping the utility companies focused and cooperating towards the shared goal of timely and cost-effective relocations. Of equal importance is accurate and complete record-keeping and the timely posting of utility information in the VDOT RUMS system, so tracking utility relocation information is readily available to the Team and VDOT partners.

### POTENTIAL UTILITY CONFLICTS AND MITIGATION MEASURES

Our Team understands the importance of avoiding utility conflicts and relocations wherever possible. We have already taken steps to minimize conflicts in the Conceptual Design, located behind "**TAB 1**" in Volume II. Project 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 to utilities.

As the design 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 individually addressed in detail in the construction schedule, emphasizing avoiding delays to the Project and defining with logic where work can be shifted, when necessary, to avoid any delays to daily construction efforts. The Utility Impact Matrix, provided in *Section 4.3.1*, identifies a portion of utilities that conflict with the proposed work. We've also included a matrix containing all utilities in the Project area behind "**TAB 2**" in Volume II.

Utility coordination activities began during the proposal preparation stage of the Project. All utility companies with facilities in the project area have been contacted, correct contact people with those companies have been

### EXHIBIT 4.4-5 | WRA Utility Coordination Process

- 1 **REVIEW RFP PLANS**
  - Initial plan review.
  - Highlight potential utilities/conflicts.
  - Determine ROW and project limits/utility easements.
- 2 **REVIEW EXISTING SUE REPORTS**
  - Review test hole information in plans.
  - Review data from SUE studies.
  - Update our initial Utility Matrix, inclusive of all utilities.
- 3 **SITE INSPECTION**
  - Experienced and local team members make site inspections.
  - Identify and quantify utilities not shown on RFP Plans and SUE reports.
  - Update our Utility Matrix and evaluate potential solutions.
- 4 **FIND SOLUTIONS FOR CONFLICTS**
  - Highlight potential alternatives.
  - Coordinate with design engineers to develop solutions.
  - Develop innovative approaches to avoid conflicts.
- 5 **UTILITY COORDINATION**
  - Meet with each utility agency (private and public).
  - Develop the Utility Relocation Schedule.
  - Update relocations in the Project Schedule.
- 6 **FINALIZE SCHEDULE/COST**
  - Verify each private utilities' prior rights.
  - Prepare VDOT UT-9 Forms for each utility.
  - Prepare a final Utility Relocation Schedule and prorate costs.
- 7 **FINALIZE DOCUMENTS**
  - Finalize relocation/adjacent plans with public utilities.
  - Combine the schedule with our Conceptual Design.
  - Submit to VDOT for approval.
- 8 **RIGHT OF WAY**
  - Obtain easements for relocation if needed.
  - Prioritize acquisitions to support early utility relocations and construction.
  - Advise utilities when right of way is available for relocations to begin.
- 9 **EXECUTION**
  - Begin utility relocations/adjustments.
  - Monitor operations for unforeseen/unknown utilities and act.
  - Maintain open communications to quickly resolve unforeseen issues.

confirmed, and existing facility records from them have been obtained. These records have been compared to the RFP Design survey and our Project site inspection for accuracy and completeness. The utility companies identified as having facilities in the project area are Appalachian Power, Citizen's Telephone, Comcast, Roanoke Gas, Salem City Electric, Salem City Water and Sewer, Segra, Verizon, Western Virginia Water and

Sewer, and Zayo Communications. Osprey Fiber has agreements with VDOT for future fiber installation in the Project area.

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. All pole work needs to be performed in a specific order, starting with the facilities at the top of the old poles, electric, and then working the way down to the lowest lines. Each utility company will be informed of their place in this rotation and will be kept informed of the progress so that crews can be mobilized when it is their turn. The utility designation survey and test holes will be a top priority for the 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 make use of the VA811 Location Enhanced Ticket Search (LETS) service offered by VA811 to ensure daily that all of 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 to have been performed by the utilities is performed. 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 ensure 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 take place immediately following the issuance of an NTP for the Project. Activities will include hosting the 45-day Utility Meeting and Preliminary Utility Review Meeting with all relevant utility companies to explain the Project's impact and work sequence. We will distribute proposal plans to the utilities to allow for their review as early as possible.

Utility companies will be made aware immediately of facilities most likely in conflict and how those conflicts

will play into the Project's staging. We 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. As the design of the Project progresses, close coordination with the utility owners will continue. Our Team will ensure that designs minimize or avoid utility conflicts by using an online, cloud-based utility coordination tracking system that incorporates both "ball-in-court" notifications and set due dates for utility coordination tasks. The utility representatives will be able to access the current version of the tracking system at all times.

When the design has reached a completeness level to show all utility impacts, our Team will hold a Utility Field Inspection (UFI) Meeting. Our Team will distribute plans and a preliminary VDOT UT-9 Form to all affected utility companies approximately two weeks before this meeting. During the UFI Meeting, all of the utilities will be able to put forth relocation strategies, preliminary schedules for performing adjustments and relocations, and utility easement requirements, if they exist.

Our Team does not expect utility easements will be necessary for this 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 of the utility companies when possible. Examples of assistance that will be made available to utility companies include traffic control assistance, clearing, construction entrances, and lay-down yards. This will reduce costs and help mitigate any delays. 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 SEQUENCING TO PREVENT DELAYS

Upon award of the Project and receipt of an NTP, utility coordination efforts will occur in a manner that is complementary to the developed sequence of construction to minimize impacts on the critical path. A significant utility impact is fiber optic lines throughout the median of I-81 along the Project corridor's entirety. Relocation of these facilities to a permanent location along the shoulders of the future roadway will be a paramount goal at the early stages of the Project. Additionally, we 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 the Project Scheduling Team to ensure that the schedule remains optimized for Project completion.

### 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) and GDR Addenda, and will perform further investigations upon receipt of an NTP. These efforts will validate and confirm our proposed design and reduce VDOT’s construction costs.

A leading national provider of geotechnical, dam, and tunnel engineering services, dedicated design subconsultant **Schnabel Engineering, LLC** (Schnabel) has extensive experience in the I-81 corridor, including numerous VDOT bridge and roadway projects; evidence of this is highlighted below in **EXHIBIT 4.4-6**. Schnabel is a leader in karst terrain evaluations, with over 1,000 projects completed in Virginia and the Appalachian Ridge and Valley.

Geotechnical Task Lead, **Steve Conner, PE**, will lead a team of geotechnical engineers who have addressed karst-related problems on hundreds of projects, including characterizing karst features and their impacts on transportation, commercial/industrial, and residential structures/facilities. Schnabel’s soil, materials, and asphalt laboratories in Blacksburg, Richmond, and three other offices, **are nearby the I-81 Project site** and accredited by the AASHTO Materials Reference Laboratory and USACE. Schnabel’s extensive geotechnical engineering experience with the various local geologies and similar projects will guide our design and analysis. Their firm has a wealth of expertise with over 125 projects along the I-81 corridor and over \$15B of D-B and P-3 transportation projects.

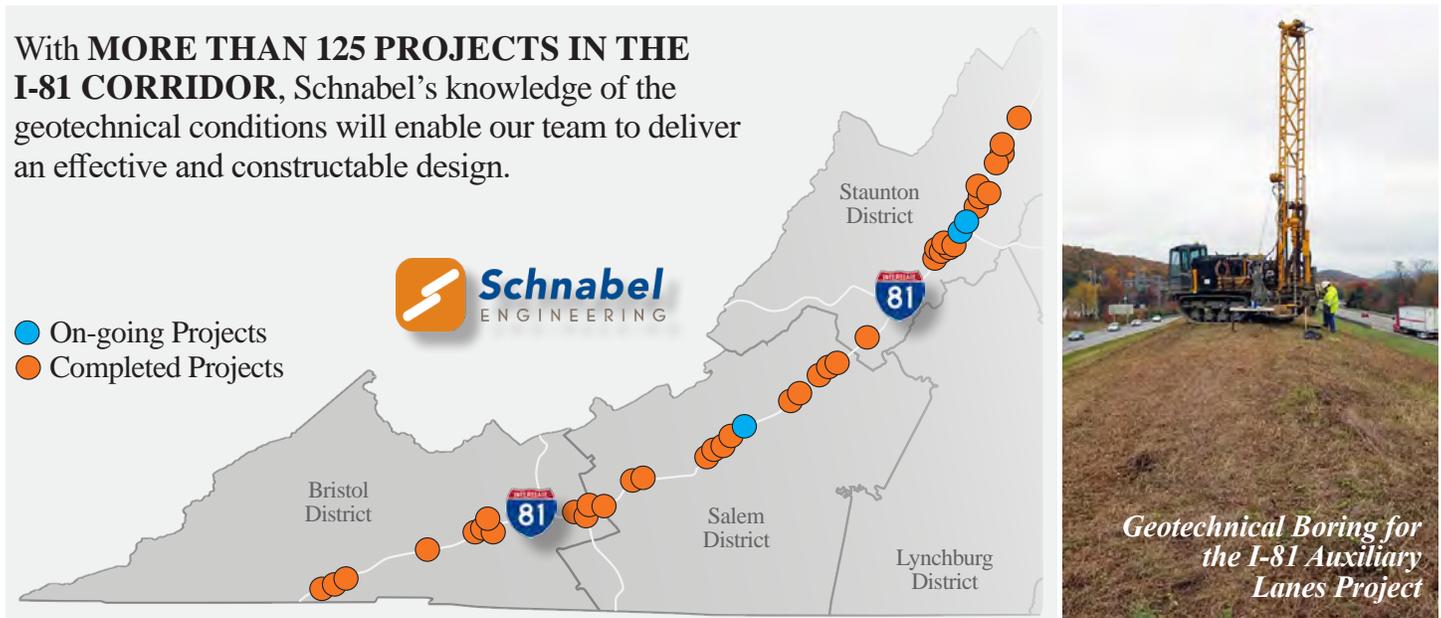
### CONSTRUCTION METHODS

Schnabel will be an integral part of this project’s construction phase and will work hand-in-hand with Branch, Orders, the Design Team, and the QC Team. Schnabel 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. We will include this certification in our monthly status report.

### ADDRESSING GEOTECHNICAL CHALLENGES

The I-81 Project is located within eight different mapped geologic formations and along the Salem Fault line. Site conditions include highly variable subsurface conditions that can create unexpected issues, increased costs and delays in the Project Schedule during construction. **Schnabel’s local experience and expertise will enable our Team to identify associated risks, extensive subsurface exploration, and laboratory testing programs to define the geologic formations.** We identified geotechnical risks on this project utilizing the borings and test results in the GDR, the GDR Supplement, and GDR Addenda (collectively, the GDRs) provided with the RFP and Addenda.

**EXHIBIT 4.4-6** | Schnabel Geotechnical Expertise in the I-81 Corridor



**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 Salem District and other similar areas have proven successful. Our subsurface exploration and testing program will include soil test borings and possibly air-track probing, rock coring, in-situ geophysical testing, and laboratory testing. This program's results will be the basis of our Final GERs, which will include recommendations to mitigate the potential geotechnical risks identified. The Final GERs could also disclose additional potential risks. Schnabel will identify these risks and provide mitigation alternatives in the final reports. Based on the existing data and local experience, our preliminary assessment of the geotechnical risks on this project include (but are not limited to) the items discussed in this section.

### ■ 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. Most of the existing bridges are founded on vertical and battered piles. The battered piles could be damaged due to settlement from constructing new embankments. The project will require the addition of foundation elements while maintaining the integrity of the existing foundations.

### POTENTIAL MITIGATION STRATEGIES

- Schnabel's experience with temporary shoring methods applicable to the Salem District and bridge replacement techniques that are safe and effective will benefit the Project's construction.
- Schnabel's team of in-house geotechnical engineers will develop efficient temporary and permanent shoring designs.
- Our Conceptual Design considers the integrity of the existing foundations (the ones to be removed and ones to remain). Items considered by our Team include the development of appropriate foundation types and their locations, the sequence of construction, shoring, and the use of lightweight materials to construct embankments.

#### ***Schnabel Experience Highlight:***

On the I-95 SB Rappahannock River Crossing Project, Schnabel utilized sheet piles as shield piles to minimize settlement for the bridge widening of Route 17.

### ■ Slopes

Our Conceptual Design includes critical and non-critical cut and fill slopes throughout the Project limits. Existing slopes are generally at 2:1 and appear stable at this time. The Conceptual Design utilizes 2:1 or flatter slopes. The geology in some of the critical and non-critical slopes has been identified as potentially APM, which could lead to issues discussed under the APM risk. Also, some slopes containing fine-grained soils may have stability issues requiring additional ROW to flatten the slope or expensive stabilization techniques to achieve an adequate factor of safety.

### POTENTIAL MITIGATION STRATEGIES

- Our Conceptual Design will minimize the disturbance of existing slopes.
- We will perform the necessary classification and shear strength testing to evaluate the slope stability.
- RFP Addendum borings indicate that around 40% of the 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 using peak shear strengths for deeper material and fully-softened shear strengths for infinite slope stability analysis.
- RFP Addendum borings indicate that most of the soils in the slopes consist of sandy soils. Because fine-grained soils were not encountered in these slopes, these slope's stability can be evaluated using peak shear strengths rather than lower fully-softened shear strengths.
- No highly-plastic soils will be used to construct new embankment slopes.

#### ***Schnabel Experience Highlight:***

On the I-81 NB Truck Climbing Lanes, (MM 195 to MM 202.5), Schnabel performed extensive in-situ sampling and laboratory testing to define suitable and unsuitable materials for use in embankment slopes to meet the VDOT's design criteria.

### ■ Karst Features

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

### POTENTIAL MITIGATION STRATEGIES

- Schnabel is experienced with design and construction in karst environments and understands critical steps to reducing risk, including:
  - » Identifying karst features.
  - » Controlling surface water.
  - » Not interfering with the groundwater.
  - » Shifting structure locations, where feasible.
  - » 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 112 intersection, karst features are present at the Route 112 Intersection. Our Team will further define these karst feature's limits during the subsurface exploration program by drilling and geophysical surveys.
- Our bridge foundation design accounts for the erratic nature of karst geology. Semi-integral abutments are used to 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).

#### ***Schnabel Experience Highlight:***

Schnabel's team of drillers and geophysicists have extensive experience in karst conditions. Recent experience includes the I-81 Over Route 686 (Mulberry Lane) Bridge Replacements.

#### ■ Acid-Producing Materials and Corrosivity

The RFP identifies potential APM within the Project limits. The Millboro and Needmore shales are mapped geologic formations that the project intersects. These formations are known at the regional level to contain APM. The RFP includes laboratory testing results for three soil samples considered Category 2 per the RFP's APM Special Provision.

The effects of APM include environmental impacts to waterways, vegetation, and wildlife; corrosion of structures, including culverts, bridges, signs, and walls, among others; and accelerated weathering of surrounding rock that can lead to rock slides and slope failures. Laboratory test results in the GDR indicate that a significant amount of the on-site soils are corrosive to metal and concrete. Excessive corrosion can lead to maintenance issues or structural failure of bridge foundations, retaining walls, and culverts.

### POTENTIAL MITIGATION STRATEGIES

- Our testing program will provide sufficient data to follow the APM Special Provision to evaluate the presence and location of APM. These test results will be used to make recommendations for avoidance to minimize disturbance by adjusting the design, covering these soils and rocks with non-aggressive fill, and neutralization with alkaline materials per the Special Provision. We will not place this material around structural foundations to reduce potential corrosive conditions.
- The Conceptual Design focuses on avoiding earthwork in potential APM areas and prioritizes the use of retaining walls to reduce APM exposure.
- Schnabel will provide an APM specialist to provide detailed analysis and recommendations for the I-81 Project when needed.
- Subsurface exploration and laboratory testing will be performed to accurately categorize the corrosivity of the various geologies and soils encountered throughout the project limits in respect to metal and concrete.
- The re-use of corrosive soils will be optimized to not be used as backfill around structures.
- Structural elements will be designed considering the soil corrosivity, such as considering the reduced flange and web thicknesses of piles supporting the bridges per Chapter 23 of the *VDOT Manual of the Structure and Bridge Division*.

#### ***Schnabel Experience Highlight:***

Schnabel's experience includes the I-95 SB Rappahannock River Crossing D-B, where recommendations for use and treatment were supported by appropriate testing of the acid-producing clays of the Calvert Formation.

#### ■ Unsuitable Soils

Almost 50% of the GDR borings indicate unsuitable materials in the upper soils (e.g., the top 3') per the RFP requirements. Based on Schnabel's experience in the I-81 Project area, a significant portion of the fill placed to construct the original I-81 will consist of unsuitable high plasticity clays and silts. The effects of unsuitable soils include increased costs and delays in construction for undercutting and/or treatment of unsuitable materials. Other potential effects include future repairs and possible structure or slope failures from not properly identifying and/or not properly remediating unsuitable materials.

### POTENTIAL MITIGATION STRATEGIES

- The depths where unsuitable soils are not allowed were updated in the RFP Addendum #2 to depths suitable for in-situ stabilization, which is generally

faster, reduces waste and extra hauling, and is more efficient than traditional undercut and replace. It also reduces exposure of undercut subgrades that could lead to additional undercutting.

- Wet soils that are considered unsuitable due to high moisture contents (except for 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.
- Highly-plastic or low CBR soils that are also considered unsuitable where present in the pavement or minor structure subgrades will be undercut and replaced with suitable soils or chemically treated in place to the extent permitted by the RFP and *VDOT Road and Bridge Specifications*.

#### ***Schnabel Experience Highlight:***

Schnabel's experience includes utilization of soils from similar geologic conditions and lime stabilization. Their recent experience includes the I-81 Auxiliary Widening Project, as well as the I-95 SB Rappahannock River Crossing D-B, where lime stabilization was utilized to mitigate undercut and replacement of unsuitable soils.

#### ■ **Cobbles and Rubble Fill**

RFP borings encountered shallow refusal, skewed augers, and cobbles in the existing fill and natural soils at each of the intersections that require bridge replacements or widening. Erratic subsurface conditions with cobbles and potential rock fill may cause early refusal, misalignment and/or damage of driven piles. These geologic conditions can also obstruct trenchless installation of culverts. Rubble fill can potentially cause a jack-and-bore installation to become stuck or lose line and grade, both of which will be problematic for gravity storm drain installations.

High groundwater and running soils may also be present in stormwater structures due to creeks or drainage channels and the potential for rock or mixed face conditions in the general geologic setting and along waterways. Issues with trenchless installation include requiring alternative trenchless equipment, unplanned soil improvement programs, unexpected MOT adjustments, settlement of active roadways, and other issues.

#### POTENTIAL MITIGATION STRATEGIES

- Additional exploration to provide a better characterization of the subsurface conditions.
- Design semi-integral abutments that allow for more flexibility in pile tolerances over integral abutments.
- Pre-boring piles will reduce the effects of shallow obstructions, ensure proper pile alignment, reduce

or eliminate pile damage, and can streamline foundation construction.

- Schnabel's in-house tunnel experts will help develop proper investigation programs, ground characterization, assessment of risks, and feasible methods for trenchless installations based on ground conditions, length and size of the stormwater structures, and potential risks. Schnabel will work with Branch-Orders to determine the best installation method based on the size and type of structure and anticipated ground conditions.

#### ***Schnabel Experience Highlight:***

Schnabel's experience for obstructions at bridge abutments includes the I-81 Over Route 686 (Mulberry Lane) Bridge Replacement Project (recently completed by Lead Contractor Orders) and the Falls Run Interceptor Project.

#### ■ **Pavement Design**

RFP Pavement sections for Mainline I-81 will be verified during the early stages of the Project development. The GDR included a limited number of CBR tests and no resilient modulus (Mr) tests or unconfined compression strength tests to correlate to the resilient modulus, as required by the specified *AASHTO Mechanistic-Empirical Pavement Design Guide (MEPDG)* method for pavement design. The GDR test results indicate the on-site materials generally have a low CBR value. The Preliminary Pavement Design Report included in RFP Addendum #3 considered a higher resilient modulus value than would be expected when correlating to CBR values.

The Pavement Design Report indicated the design resilient modulus was based on laboratory testing Schnabel performed for the Auxiliary Lanes Project and the falling weight deflectometer data performed by others specifically for this project. The subgrade strengths beneath the pavement sections need to be further investigated to evaluate the required minimum pavement sections for the project. An inadequate pavement section could lead to poor service life and increased maintenance and long-term costs.

#### POTENTIAL MITIGATION STRATEGIES

- Performing additional testing for CBR and Mr to validate the minimum pavement sections in the RFP. Schnabel will perform this work during the scope validation period.
- Schnabel was one of the first consultants in Virginia to utilize the MEPDG in practice. Their team has extensive experience with MEPDG designs, which will help in evaluating the large stone and

FDR pavement sections specified in the RFP. Their staff also understands the sampling and laboratory requirements necessary for the MEPDG analysis.

#### ***Schnabel Experience Highlight:***

On the I-95 SB Rappahannock River Crossing D-B, the RFP pavement section did not meet the VDOT MOI Chapter 6 requirements. VDOT and Schnabel worked together to determine a solution that met the District's requirements.

### **4.4.4 QUALITY ASSURANCE AND QUALITY CONTROL**

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 through the processes, reviews, and reporting activities required to meet quality guidelines and deliver this Project to VDOT, the citizens of Roanoke County, and the City of Salem on time and budget.

The QA/QC Plan will detail 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.**

Our Quality Assurance Manager (QAM), **Chad McMurray, PE, PMP, CCM, DBIA**, will act as a single point-of-contact with VDOT and will manage the QA/QC Plan in accordance with the I-81 Project Contract. **With more than 26 years of experience**, Mr.

McMurray will work independently of the Designer, Contractor, and QC Team. He will act on behalf of VDOT to ensure that all work and materials, testing, and sampling are performed according to the Contract's requirements and the Approved for Construction (AFC) plans and specifications.

**Mr. McMurray will be available immediately upon contract award and on the I-81 Project site full-time for the duration of construction operations.** He will also be supported by two full-time on-site Senior QA Inspectors, with one focused on grade work and one focused on bridge work. An additional two to three QA Inspectors will be on-site as work levels demand, with additional support available as needed utilizing materials testing technicians or additional QA inspectors.

#### **DESIGN QA/QC APPROACH AND STAFFING**

Our Team integrates quality managers into its management staff. Design QA/QC Manager, **Brad Stipes, PE**, will be an integrated member of the Design Team and will be invited to all management meetings to facilitate consistency and communication. He will work closely with Design Manager, **Mike Russell, PE, DBIA**, and design discipline task leads to ensure the review process proceeds according to the QA/QC plan. Our experience and commitment to providing quality and knowledge of RFP requirements, standard specifications, among others, has shown to significantly reduce VDOT's review time and minimize the need for additional QA/QC reviews.

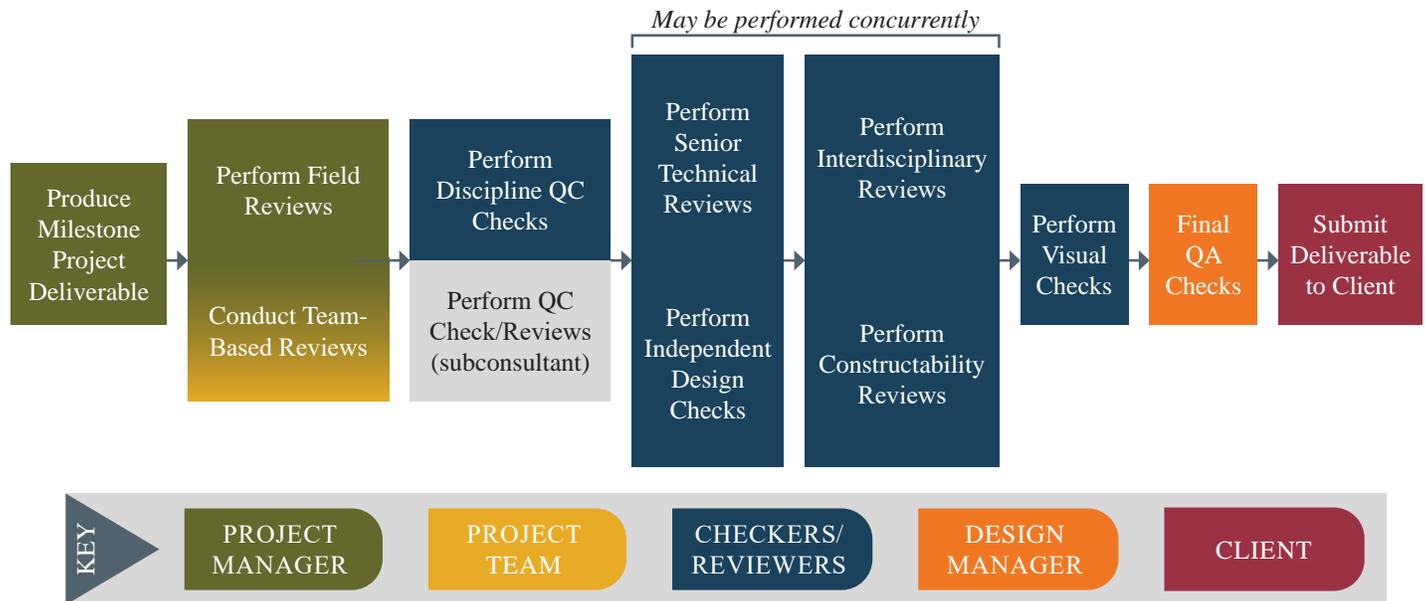
The design quality process will be managed using conformance checks, independent technical reviews, and internal audits. These checks will verify our drawings and specifications comply with applicable criteria and contract requirements. On previous projects, this attention to detail on QA/QC reviews and processes has proven beneficial to VDOT in performance audits. Quality checks and reviews will be per the Quality Planning process and identified in a Project Deliverable

#### **TEAM MEMBER HIGHLIGHT: Quality Assurance Manager**

Mr. McMurray is responsible for construction management and inspection (CMI) for the Southwest Virginia territory of WRA's southern CMI operations. In this role, he has direct control and supervision of all CMI services provided out of the area and oversees a staff of 20 employees. He has 26 years in construction on major highway transportation projects and acting as QAM on D-B projects for VDOT. With extensive experience in the I-81 corridor, he recently worked as the QAM on the I-81 over Route 11. Working with Lead Contractor, Orders Construction, his responsibilities included the development, updating, and implementing of a project specific QA/QC plan for a project that included two bridges on I-81. His additional experience includes the I-81 Exit 114 D-B in Montgomery County and I-81 Halls Bottom Road Bridge Replacement D-B in Washington County.



**Chad McMurray, PE, PMP, CCM, DBIA**  
*Whitman, Requardt & Associates, LLP*


**EXHIBIT 4.4-7** | Design Quality Checks and Reviews


Quality Matrix. This matrix will establish the framework for all design QA/QC activities. The Project Deliverable Quality Matrix defines the time frames for all quality checks and reviews necessary before submitting a deliverable to VDOT. This process is further explained above in **EXHIBIT 4.4-7**.

Our Team will complete a Discipline QC Check, Independent Design Check (when applicable), and Senior Technical Review (when appropriate). Those comments are resolved and verified before entering Interdisciplinary or Constructability Review. Entrusted Engineer-in-Charge, **Maggie Cossman, PE, DBIA**, will be the conduit between the Construction and Design Teams during this interdisciplinary review. All checks and reviews will be completed, and those comments resolved and verified before completing the QA Review.

We will take steps to ensure each design element receives a thorough review and is documented accurately. QC begins with assigning the most appropriate person to a given design task from the outset. **Each member of the Team is responsible for controlling the quality of the deliverable.** The specific checking process for each design element involves an Originator, Checker, Back-Checker, Updater, and Verifier, for which explanations for each are provided below:

- **ORIGINATORS:** These are engineers or other qualified persons that initiate a work product. They continuously check their specific work elements during production and must address all comments,

questions, and revisions noted by the checkers. The Originator also coordinates reviews with the Design QA Manager, who maintains the schedule to ensure the timely completion of required checks.

- **CHECKER:** These reviewers perform detailed checks of the design or reviews of reports; they are not involved in the production of those documents. These Team members 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 review the checker's comments and resolves any differences regarding the comments. The Back-Checker then makes, supervises, and implements the agreed-upon changes. This person is typically the originator of the document.
- **CORRECTOR:** This is 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:** The verifier reviews the corrected document to verify 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 to utilize the Deliverables Management component of ProjectWise to process and track the various design submittals required. Once a submittal has finalized by following the QA/QC process was described previously, it will be transmitted to the JV's Document Manager. This individual will be responsible for processing the

submittal into Deliverables Management following the appropriate review flow developed for the project. This coordination will ensure all relevant staff are notified that the submittal is ready for VDOT’s review. Our quality review process is further demonstrated to the right in **EXHIBIT 4.4-8**.

**CONSTRUCTION QA/QC & STAFFING**

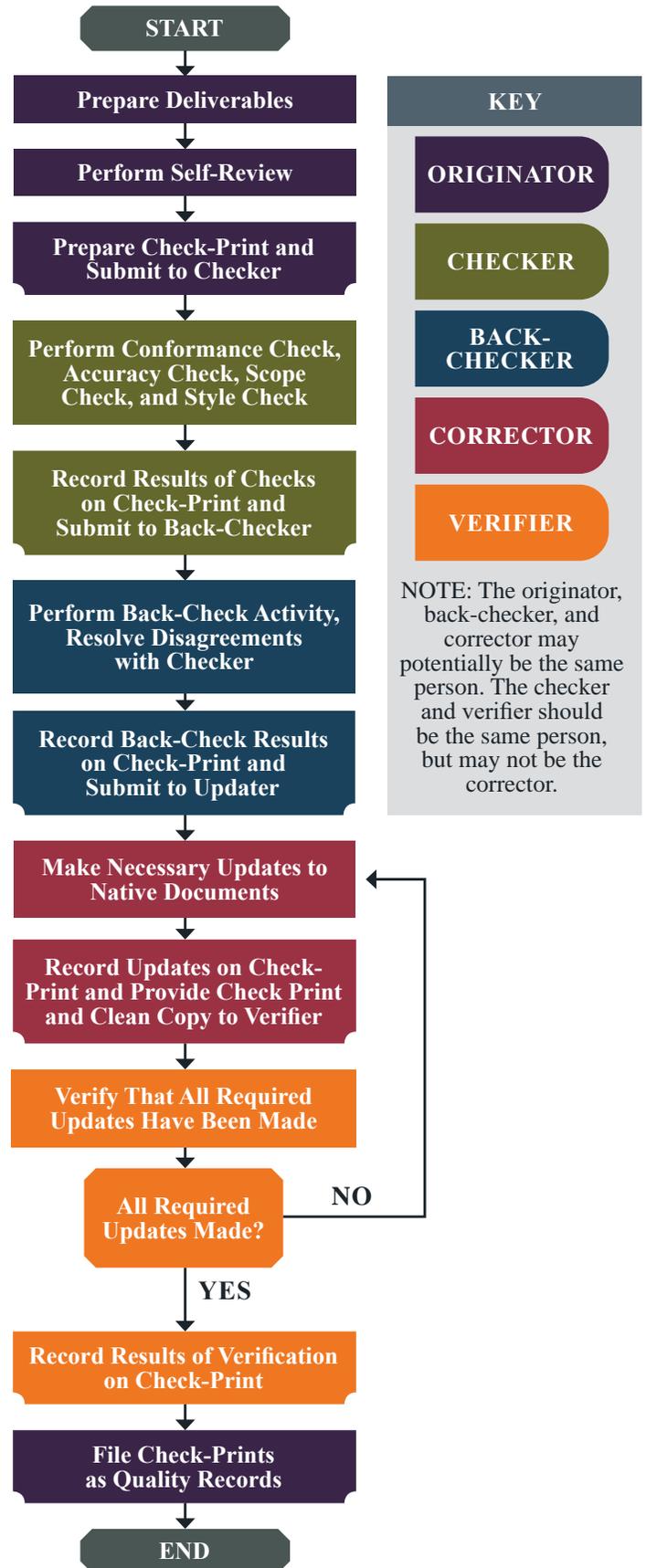
The QAM, **Chad McMurray, PE, PMP, CCM, DBIA**, reports directly to the DBPM, **Jeff Humphreys, DBIA**, and is responsible for overseeing QA for all construction activities. **Mr. McMurray has the responsibility and authority to report any findings directly to VDOT and stop any work that fails to meet contract requirements.** He will oversee the personnel responsible for performing QA inspections and testing all materials used and work performed. Adequate QA staff will be available to ensure that VDOT does not require additional QA/QC oversight. Staffing levels will be determined by the schedule and Testing and Inspection Plan developed for each Work Package. We anticipate that the number of QA inspectors will range from two to five 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 are compliant with the approved drawings, specifications, and applicable standards and reference documents, as indicated in the Contract. Mr. McMurray will also ensure all inspectors have the appropriate certifications for the testing to be performed.

QC Manager (QCM), **Austin Williams**, will report directly to Construction Manager, **Bob Cross**. Mr Williams 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.

QC Inspectors for Roadway and Bridges will complete an Inspector Daily Report (IDR). The IDR will be submitted to the QCM, QAM, DBPM, Construction Manager, 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. Between two and eight QC inspectors are anticipated on the Project.

**EXHIBIT 4.4-8** | Design Quality Review Process



**EXHIBIT 4.4-9** | Construction Quality Assurance/Quality Control Process

CONSTRUCTION QA/QC PLANNING	EXECUTION	CLOSEOUT
<ul style="list-style-type: none"> <li>• Review the Project Schedule.</li> <li>• Review item specifications.</li> <li>• Develop inspection work plan.</li> <li>• Schedule pre-item work meeting.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct preparatory meeting.</li> <li>• Perform inspection and documentation.</li> <li>• Perform required materials testing.</li> <li>• Enter documentation into PlanGrid® (or similar).</li> </ul>	<ul style="list-style-type: none"> <li>• Confirm all work is completed.</li> <li>• Item pre-final inspection.</li> <li>• Create pre-final punch list.</li> <li>• Project final inspection/punch list.</li> <li>• Punch list work completed.</li> <li>• Project acceptance.</li> </ul>

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

As part of the AFC work package, the QAM will work with the Design Manager to identify all work elements that will require testing. As part of this process, the QAM and the QC Manager will review the Project Schedule to determine the staffing needed for the work package. The QAM and QC Manager will also confirm that all required certifications are maintained, identify the definable features of work included in the package, and establish the minimum testing and inspection requirements needed to ensure all work is completed based on the quantities in the work package comply with the Project’s requirements. This process, demonstrated above in **EXHIBIT 4.4-9**, provides appropriate staffing for the job and establishes all team members' expectations for the QA/QC of the work.

Conducting a pre-item work meeting before the preparatory meeting for each definable feature of work is the next step in ensuring that all requirements are met. This meeting establishes who will be required at each preparatory meeting, ensures all information is reviewed, and verifies 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, the QA personnel will monitor the work and monitor the QC process for adherence to the plan. Hold point meetings will be held for all major construction operations. QA will also coordinate their independent assurance system to independently evaluate all sampling, equipment, and testing and inspection procedures used by QC personnel.

This system ensures 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 made to the plan 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 documentation required for the Project and will establish a system of cloud-based document control, allowing all Team members to have immediate access to the information needed.

The system will also comply with VDOT’s D-B Construction Quality Improvement Program (DBCQIP) by putting in place procedures to document that tasks were completed in accordance with the requirements and DBCQIP checklist.

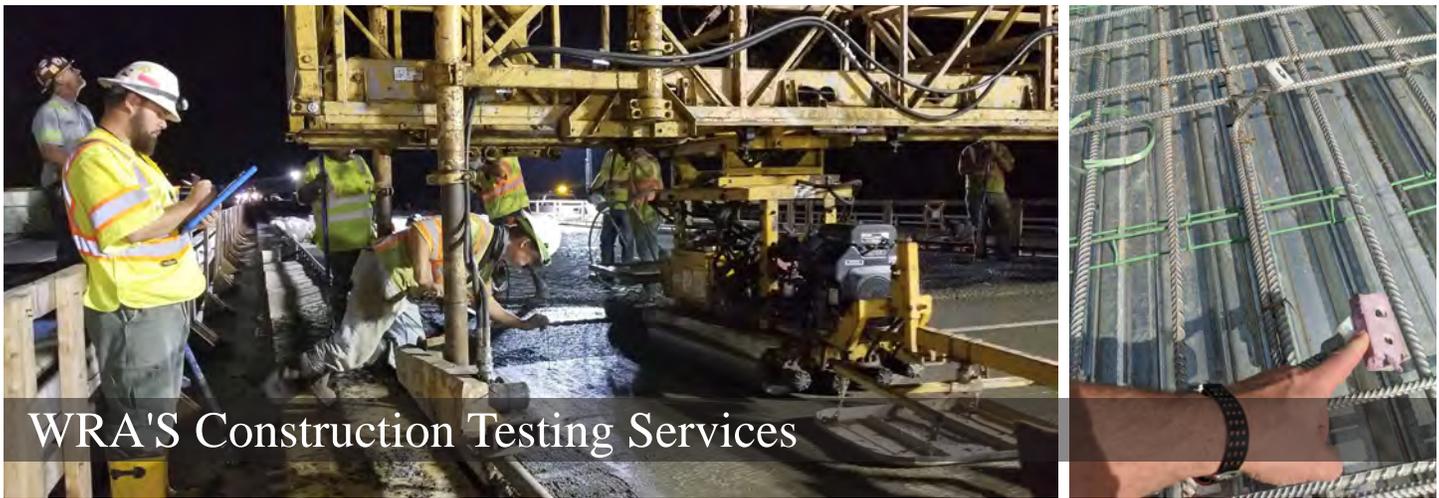
**CONSTRUCTION QA/QC STAFFING PLAN**

For a project of this size, scope, and complexity, we understand that our 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 procedures developed establish proper controls so that the 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 have ultimate responsibility to ensure that Project policies are effectively implemented. He also will ensure that our Team is staffed with knowledgeable and dedicated people who are committed to designing and constructing the Project.

**EXHIBIT 4.4-10** on page 39 outlines primary quality personnel and their respective responsibilities.


**EXHIBIT 4.4-10** | Construction Quality Assurance/Quality Control Personnel and Responsibilities

NAME/ROLE	REPORT	DESCRIPTION OF RESPONSIBILITIES
<b>M. Jeff Humphreys, Jr,</b> DBIA D-B Project Manager	Reports to VDOT	<ul style="list-style-type: none"> <li>Responsible for the overall Project design and construction, QA/QC management, and contract administration.</li> <li>Ensures the Project receives the necessary staff and equipment.</li> </ul>
<b>Maggie Cossman, PE,</b> DBIA Entrusted Engineer-in-Charge	Reports to the DBPM	<ul style="list-style-type: none"> <li>Responsible for ensuring that all work is integrated and is in conformance with the Contract Documents.</li> <li>Ensures constructability and functionality.</li> <li>Compiles the final AFC Plans and Specifications.</li> <li>Will be onsite full time from commencement of construction through Final Acceptance of the Project.</li> </ul>
<b>Chad McMurray, PE, PMP,</b> CCM, DBIA QA Manager	Reports to the DBPM and VDOT	<ul style="list-style-type: none"> <li>Responsible for overall development, implementation, and periodic assessment of the team's QA/QC Plan and independent QA inspection and testing of all materials and work.</li> <li>Verifies that all work and materials testing and sampling on the Project are performed in conformance with the contract requirements and the AFC plans and specifications.</li> <li>Has full authority to stop any work that fails to meet the requirements of the contract documents.</li> <li>Develops the QA/QC Plan, manages the QA testing and sampling program, monitors the contractor's QC program, assures quality in meeting contract requirements, maintains documentation and test reporting, reviews, and certifies requests for payments to VDOT, and communicates closely with VDOT regarding compliance results.</li> <li>Works directly with the Design Manager, Mike Russell, PE, DBIA, to resolve quality issues that require design input.</li> </ul>
<b>Kemmy Mullins</b> Lead QA Roadway  <b>Tony Guy</b> Lead QA Bridge	Reports to the QAM	<ul style="list-style-type: none"> <li>Verifies QA testing and inspection activities are completed, QC inspections are observed, and any non-conformities are corrected and documented.</li> <li>Responsible for QA inspection activities for conformance with AFC plans and specifications.</li> <li>Responsible for documenting and reporting all inspection and testing within 24 hours of work performed.</li> <li>Additional WRA QA Inspectors will support Lead QA Inspectors when assistance is needed.</li> </ul>
<b>SC Stevenson Consulting Staff</b> QA Testing Lab	Reports to the QAM and Lead QA Inspectors	<ul style="list-style-type: none"> <li>Provides an AMRL-certified laboratory.</li> <li>Completes QA laboratory testing.</li> </ul>
<b>Bob Cross</b> Construction Manager	Reports to the DBPM	<ul style="list-style-type: none"> <li>Responsible for QC activities and ensuring construction is performed safely and materials and work are in conformance with the approved plans/contract documents.</li> <li>Responsible for implementing and executing the Construction QC plan.</li> </ul>
<b>Austin Williams</b> Construction QC Manager	Reports to the Construction Manager	<ul style="list-style-type: none"> <li>Responsible for verifying all work, materials, inspections, and testing are compliant with contract requirements.</li> <li>Supports the implementation and execution of the Construction QC plan.</li> <li>Ensures the adequate staffing of qualified QC testing and inspection personnel.</li> </ul>
<b>NXL Staff</b> QC Inspections for Roadway and Bridges	Reports to the QCM	<ul style="list-style-type: none"> <li>Responsible for QC inspection and testing of items of work for conformance with AFC plans and specifications.</li> <li>Responsible for documenting and reporting all inspection and testing within 24 hours of work performed.</li> </ul>
<b>ECS Staff</b> QC Testing Lab	Reports to the QCM	<ul style="list-style-type: none"> <li>Provides an AMRL-certified laboratory and completes QC laboratory testing.</li> <li>Materials testing field and laboratory professionals are VDOT-certified to provide the most thorough inspections and accurate reporting available.</li> <li>Responsible for QC inspection activities for conformance with AFC plans and specifications.</li> </ul>



## WRA'S Construction Testing Services

WRA has performed QA/QC services in the I-81 corridor and are familiar with the area's geology.

**Top left photo:** QA/QC concrete depth check on the I-81 over Route 11 Project.

**Top right photo:** Rebar check identifying improper rebar tie on the I-81 over Route 11 Project.

**Bottom right photo:** QC deck pour dry run on the I-81 over Route 11 Project.



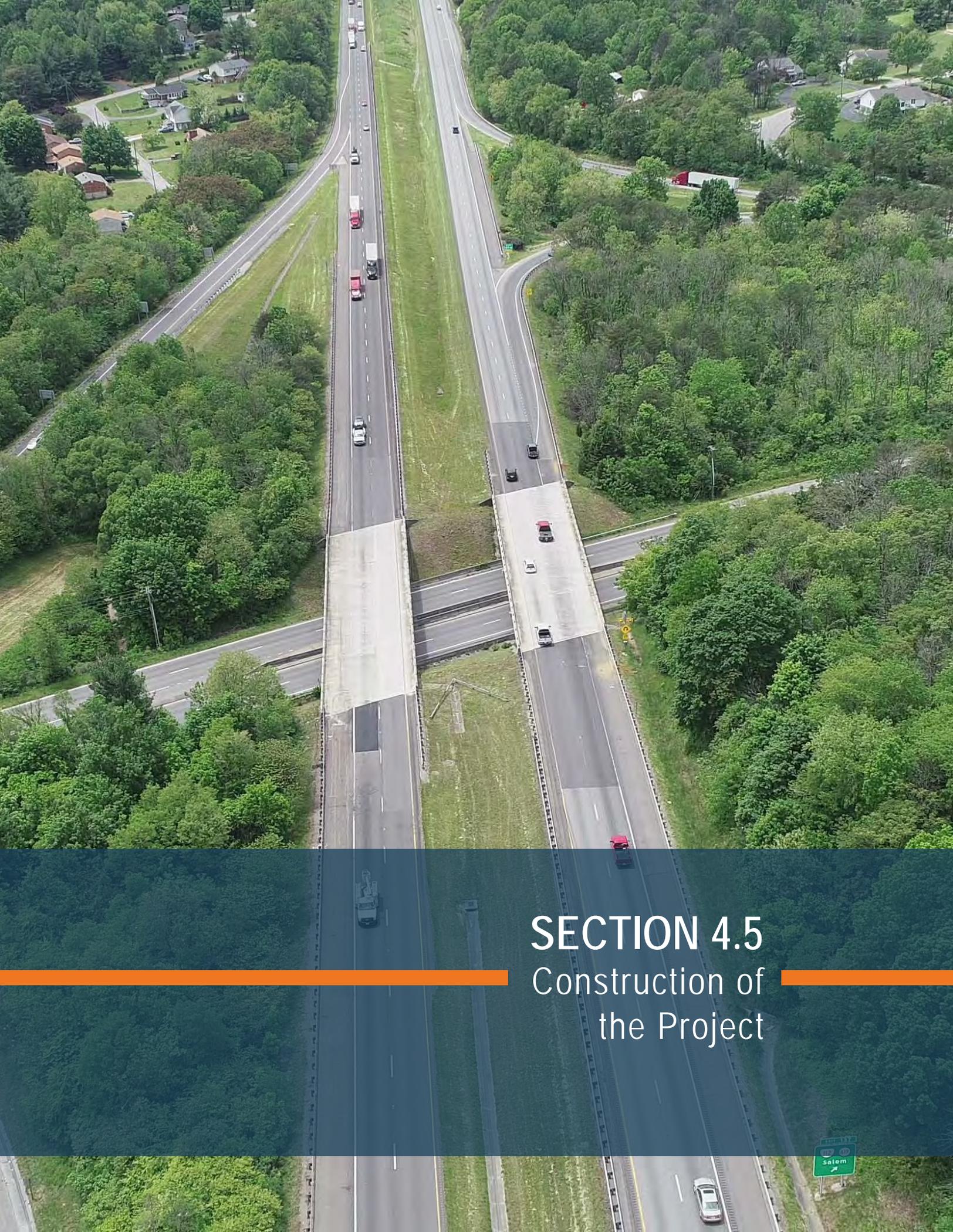
## ENSURING PROJECT QUALITY

Our Team places a strong emphasis on quality, realizing that ***our work is our legacy***. We will reinforce to all Team members who work on design and construction that quality begins with them. To guide them on this mission, we will create a QA/QC Plan using proven policies and control methods to produce quality work. It will be structured to assist our Team in properly managing quality compliance and providing an objective measure of quality performance. All employees will comply with the requirements specified by the QA/QC Plan.

Our QA/QC Plan requires the performance of periodic audits of the contractor, designer, subconsultants, subcontractors, and suppliers. A best practice learned through the years and as a proactive measure, Branch-Orders will visit fabricators' shops to ensure they are following quality standards. Doing so will reduce the risk of quality issues onsite. We will implement a document control system to identify and control materials in coordination with the schedule. Submittals will include all shop drawings, samples, certificates, test reports, and technical information required by the Contract.

We will require all subcontractors to adhere to the project-specific QA/QC plan developed. Additionally, all suppliers of materials and producers will be part of VDOT's QA/QC program and be on VDOT's pre-approved materials lists. We will notify the Department at least a month in advance of the materials for which the Department retains responsibility for testing. We will receive, handle, and properly store all construction materials and closely monitor them for compliance with contract specifications.

**Our approach to QA/QC is to identify the issue immediately, communicate with VDOT, perform additional testing to diagnose the problem, propose potential solutions, select, implement the desired resolution, and apply corrective procedures sure it does not reoccur.**



**SECTION 4.5**  
Construction of  
the Project



# 4.5 CONSTRUCTION OF THE PROJECT

OUR TEAM WILL PROVIDE DELIVERY CERTAINTY. HOW? BY USING A SIMPLIFIED APPROACH TO CONSTRUCTION SEQUENCING THAT LEVERAGES **EXTENSIVE LOCAL KNOWLEDGE**, ESTABLISHED STAKEHOLDER RELATIONSHIPS, AND A DEDICATION TO SAFETY AND QUALITY. OUR INTEGRATED JV WILL UTILIZE ITS **DIRECT EXPERIENCE IN THE I-81 CORRIDOR** TO DELIVER PROJECT EXCELLENCE.

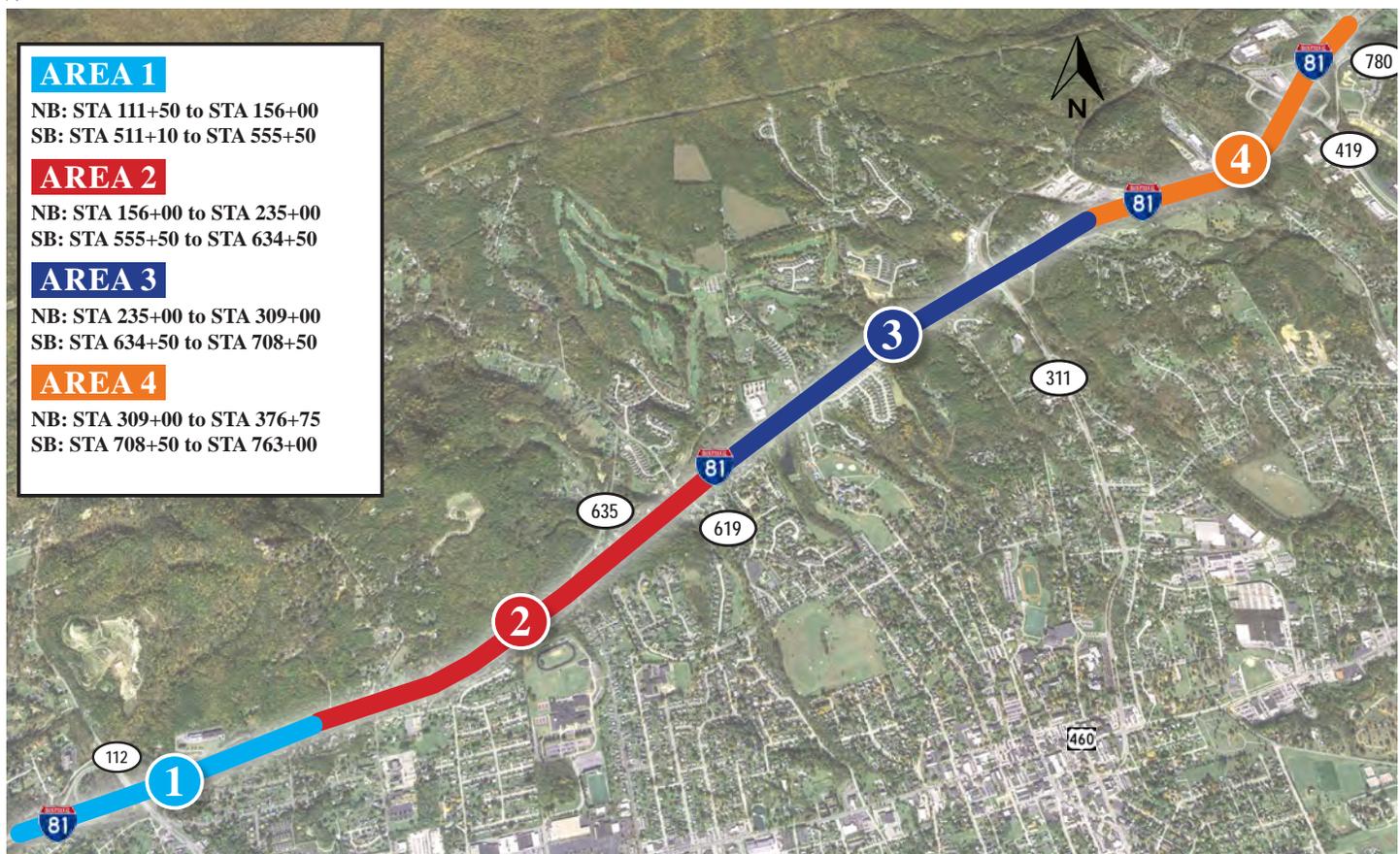
## 4.5.1 Sequence of Construction

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 within the Project corridor. Our approach will deliver Project 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 75% of the work provides the control necessary to ensure timely delivery.** Moreover, no construction activity will proceed without assurance that all safety and environmental protection measures have been followed.

## OVERALL PROJECT MANAGEMENT

Our Team developed an overall plan for construction through an intimate knowledge of the local area. **All key Team members reside in the Project area, and many use the Project corridor in their daily commute.** As demonstrated below in **EXHIBIT 4.5-1**, construction operations are organized logically and systematically into four Project Areas, each containing relatively similar scopes of work and shorter activity durations. **This Project Area breakdown provides phasing flexibility and will allow the Team to advance to the next Phase when the previous Phase is completed.** We will perform work within each Project Area concurrently to achieve a Final Completion Date of January 15, 2026.

**EXHIBIT 4.5-1** | Project Construction Areas



**Our approach simplifies construction and enhances schedule flexibility to ensure on-time, on-budget delivery of the I-81 Project.** Our Conceptual Design 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 is provided below.

### ■ Phase 1 Construction Operations

Phase 1 will include preparatory operations on I-81 NB and SB lanes. The following will take place during this phase:

- Establish centralized staging areas and mobilize.
- Perform right shoulder strengthening throughout the entire Project corridor, both NB and SB as required, to facilitate traffic shift and Phase 2 construction. These activities will be performed at night under temporary lane closures and by progressing through all areas, which efficiently allows for linear progression and repetition of activities.
- Construct stormwater management basins working behind the existing guardrail at wider shoulder areas or from alternate access points. This will ensure that all necessary erosion and sediment control (E&SC) measures are in place prior to any land disturbing activities in later Phases.
- Remove and relocate existing utilities located in the median.
- Establish the required ROW so that necessary adjustments can be secured well in advance of Phase 3 work.
- Lower the existing roadway profile on Route 635 under I-81 to preclude conflicts with schedule restrictions for this work.
- Perform Early Work Packages in areas where there are no utility conflicts or environmental issues. Activities will include maintenance work on the following bridges:

#### ■ Area 3: Bridge B682 (Route 705 Bridge over I-81)

- » Installation of embedded galvanic anodes.
- » Concrete substructure surface repair.
- » Concrete surface protection.

#### ■ Area 3: Bridge B677 and B678 (I-81 over Route 311)

- » Installation of embedded galvanic anodes.
- » Concrete substructure surface repair.
- » Concrete crack repair (Type B).
- » Steel crack repairs (welding).

#### ■ Area 4: Bridge B681 (Route 419 Bridge over I-81)

- » Installation of embedded galvanic anodes.
- » Concrete substructure surface repair.
- » Concrete surface protection.

- Perform temporary paving before utility relocations take place.
- Establish temporary MOT for switch to Phase 2 (e.g., temporary barrier service, construction signs, temporary pavement markings, among others) within the mainline corridor and shift traffic onto the strengthened shoulder both NB and SB. It is planned for these operations to be performed in a stacked linear progression through all areas to attain greater efficiency, with crews and subcontractors performing repetitive tasks.

### ■ Phase 2 Construction Operations

Phase 2 will include grading and drainage; construction of new bridge and miscellaneous structures; and roadway widening in the median. The following will take place during this phase:

- Establish construction access to the median through entire Project and set up satellite staging locations for on-site distributions.
- Clear and grub the work area, which will include the demolition or removal of any conflicting existing roadway elements.
- Perform remaining utility coordination and relocations not completed in Phase 1.
- Perform all median grading and drainage and permanent median barrier construction throughout all four Construction Areas to the final proposed roadway and bridge alignments.
- Perform partial demolition and construct temporary shoring and new bridge structures to the median at the following:

#### ■ Area 1: Bridges B683 and B688 (I-81 over Route 112)

- » Partial superstructure/substructure removal.
- » Installation of temporary shoring.
- » Construction of MSE walls and abutments on driven steel piles.
- » Pier construction on micropiles.
- » Installation of new structural steel girders.
- » Construction of new deck, approach slabs, and parapet.

#### ■ Area 2: Bridges B684 and B685 (I-81 over Route 635)

- » Partial superstructure/substructure removal.
- » Installation of temporary shoring.
- » Construction of MSE walls and abutments on driven piles.
- » Installation of new structural steel girders.
- » Construction of new deck, approach slabs, and parapet.

#### ■ Area 2: Bridges B686 and B687 (I-81 over Route 619)

- » Partial superstructure/substructure removal.
- » Installation of temporary shoring.

- » Construction of MSE walls and abutments on driven piles.
  - » Installation of new structural steel girders.
  - » Construction of new deck, approach slabs, and parapet.
  - Widening to the median of the following existing structures will also be performed in Phase 2:
    - **Project Area 3: Bridges B677 and B678 (I-81 over Route 311 NB)**
      - » Partial removal of the substructure and superstructure.
      - » Installation of temporary shoring.
      - » Construction of cast-in-place abutments on driven piles.
      - » Installation of new structural steel girders.
      - » Construction of new deck, approach slabs, and parapet.
      - » HES Patching Type B, Type A Hydro-Demolition, and latex overlay.
    - Place stone base and pavement structure up to the intermediate asphalt layer throughout, thereby only leaving surface asphalt and permanent pavement markings to be completed in Phase 4.
    - Establish temporary MOT for switch to Phase 3 (e.g., temporary barrier service, construction signs, temporary pavement markings, among others) and switch traffic from right shoulder to the median throughout.
  - **Phase 3 Construction Operations**

Phase 3 will include grading and drainage; construction of retaining walls and noise barriers; replacement of bridges; and roadway widening. The following will take place during this phase:

    - Clear and grub the work area, which will include demolition or removal of any conflicting existing roadway elements.
    - Perform any necessary ramp reconstruction work to include tie-ins with secondary routes at interchanges.
    - Perform all right shoulder side grading/drainage and permanent barrier construction throughout building to the final proposed section and structures.
    - Install of guardrail and permanent sign structures along the right shoulder.
    - Construct all proposed retaining walls.
    - Construct sound walls throughout the Project.
    - Perform remaining demolition and replacement of the following structures:
      - **Area 1: Bridges B683 and B688 (I-81 over Route 112)**
        - » Full removal of existing structure.
        - » Installation of temporary shoring.
        - » Construction of MSE walls and abutments on driven steel piles.
      - » Pier construction on micropiles.
      - » Construction of new structural steel girders.
      - » Construction of new deck, approach slabs, and parapet.
      - **Area 2: Bridges B684 and B685 (I-81 over Route 635)**
        - » Full removal of existing structure.
        - » Installation of temporary shoring.
        - » Construction of MSE walls and abutments on driven steel piles.
        - » Construction of new structural steel girders.
        - » Construction of new deck, approach slabs, and parapet.
      - **Area 2: Bridges B686 and B687 (I-81 over Route 619)**
        - » Full removal of existing structure.
        - » Installation of temporary shoring.
        - » Construction of MSE walls and abutments on driven steel piles.
        - » Construction of new structural steel girders.
        - » Construction of new deck, approach slabs, and parapet.
    - Perform widening and rehabilitation of the following structures:
      - **Area 3: Bridges B677 and B678 (I-81 over Route 311 NB)**
        - » Removal and replacement of overhang and parapet.
        - » Construction of new structural steel girders.
        - » Construction of new deck, approach slabs, and parapet.
        - » Backwall and joint reconstruction.
        - » HES Patching Type B, Type A Hydro-Demolition, and latex overlay.
        - » Replacement of existing beam bearings.
  - Installation and integration of roadway lighting and ITS.
  - Complete reforestation and landscaping throughout the Project.
  - Perform staged removal of temporary MOT items 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, and installation of signage will occur. The following will take also place:

  - Perform final paving and installation of pavement markings in all Project Areas.
  - Install permanent signage in all Project Areas.
  - Convert any temporary sediment basins designated to remain as a stormwater management structure to their permanent configuration.
  - Switch traffic into its final pattern.

**EXHIBIT 4.5-2** | Key Elements of the Team's Safety Measures

ITEM	SAFETY MEASURE(S) THE BRANCH-ORDERS TEAM WILL TAKE
<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 project safety hazards.</li> <li>• A list of action items will be generated to address and make sure that potentially hazardous work activities are safely and rigorously eliminated.</li> </ul>
<b>Training</b>	<ul style="list-style-type: none"> <li>• All employees will undergo safety training for project specific activities.</li> <li>• Training will include first aid/CPR, trenching and excavation, fall protection, and rigging.</li> </ul>
<b>Site Orientation Meeting</b>	<ul style="list-style-type: none"> <li>• A safety orientation will be given to all individuals who visit the Project site.</li> <li>• Orientations will ensure that all on-site personnel have 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 completion of a Job Hazard Analysis (JHA) form.</li> <li>• Activities will ensure 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>• Hold daily meetings with all on-site personnel to review the Daily Risk Assessment (DRA). Meetings will address the day's activities (established in the pre-task planning) 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 (PSP)</b>	<ul style="list-style-type: none"> <li>• The PSP will recognize and addresses the unique attributes of the 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 project-specific safety orientations will be performed for all workers and site visitors, regardless of affiliation.</li> <li>• The PSP comply with Virginia Occupational Safety and Health (VOSH) Standards and will include safety policies, procedures, training programs, worksite controls, and incident response procedures for ensuring the safety and health of workers and the general public.</li> </ul>

**APPROACH TO SAFETY AND OPERATIONS**

Our Team will make **safety the 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 takes place. Our Safety Plan will be based on proven and successful plans from recent VDOT projects. The Safety Team, led by Safety Manager, **Danny Minnix**, and supported by Construction Manager, **Bob Cross**, superintendents, the construction JV Safety Team, and all site personnel, will share a common goal: **to maintain a safe site at all times**.

Safety measures our Team will implement for the I-81 Project are highlighted in this section and are summarized above in **EXHIBIT 4.5-2**. We are aware that construction activities on I-81 present extraordinary challenges for safety. **With direct knowledge of the I-81 corridor, Branch is currently working on the nearby I-81 MM 141 to 143 Project. Additionally, Orders has a proven track record with numerous bridge replacements in the southwestern I-81 corridor.** Lessons learned will be directly applicable to the successful completion of this Project. Site constraints created by working between opposing lanes of traffic requires 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 dictates 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 that allow for 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 ensures 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. When working in constrained circumstances, large material deliveries, such as structural steel, will not be staged onsite and will be sequenced for nighttime delivery 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) forms, and Daily Risk Assessments (DRAs) are proactive ways to track and address safety on-site, incorporate corrective actions, and identify additional tools needed to safely perform the work. By focusing on “doing the right thing,” the Safety Leadership Team has taken safety reporting to a new level. Employees know by consistent experience and observation that reporting any safety issue is the right thing to do.

Mr. Minnix will maintain a Safety Statistics Report that tracks safety incidents, including recordable, reportable, and near-miss incidents. He will also track the number of staff hours worked safely to help identify which operations could be improved. He will also lead monthly Safety Leadership 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. We 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

Our Team has identified potential staging and storage area options in the I-81 Project corridor. These areas will be located within the construction limits of the Project. Materials will be carefully coordinated with the crews' needs to limit double handling and minimize large storage areas' need. We will give each supplier-specific delivery instructions and directions to mitigate potential impacts on the traveling public and stakeholders. All major hauling activities to and from the I-81 Project site will be performed on primary and interstate roadways and avoid residential areas.

Construction entrances located adjacent to the public road will provide delivery access to the work areas. Our Team will perform activities in a manner that ensures that preexisting conditions are not worsened. We will coordinate all construction entrances to ensure appropriate sight distance is available for safe egress from these access points. The limitations on the workspace presented by the phasing of construction on the I-81 Project will necessitate prioritizing limited on-site storage and the utilization of separate primary staging locations. The majority of 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



## A Dedication to Safety

We involve our employees in the safety process at every level of the organization. All employees have the right – and the responsibility – to stop work if unsafe practices occur. As a result, we have managed growth in each of our organizations while simultaneously reducing our incidents.

safety protocol from presenting a hazard and keeping the work areas clear of unnecessary obstructions. This centralized Project staging and secondary material distribution approach have proven to be an effective and safer approach for other highly constrained completed projects in the I-81 corridor.

### ANTICIPATING/MITIGATING POTENTIAL DELAYS

Every D-B project presents a unique set of challenges that require additional attention and transparency with stakeholders to minimize schedule risks and impacts on infrastructure users. In this section, potential problems are discussed, along with methods we will use to mitigate the Project Schedule's effects.

### ■ Coordination with Adjacent Projects

Pursuant to the Part II, Section 1.7 of the RFP, the Team will coordinate all construction activities with the following projects:

- VDOT Projects:
  - » I-81 NBL & SBL, MM 141.8 – MM 143.99 (UPC 108906).
  - » Route 311 and Route 419 Intersection (UPC 108904).
  - » I-81 Bridges over Route 311 (UPC 114300)
- City of Salem Project:
  - » West to East Main Street – Downtown City of Salem (Project No. 0460-129-249).
- OSPREY Fiber Installation throughout the I-81 Project Corridor.

Our Team will diligently coordinate with contractors of other active construction projects in the vicinity of the I-81 Project throughout design and construction. The DBPM will organize and conduct joint meetings with other contractors quarterly at a minimum or as requested by VDOT. VDOT will also be invited to

these meetings. All progress milestones will be developed and mutually agreed upon by our Team and contractors of nearby projects.

#### ■ Maintaining the Construction Schedule

ROW acquisition and utility relocation are critical activities that influence the start and sequence of our construction schedule. Prioritizing these activities to maintain our proposed construction sequence will be extremely important. As discussed previously, we developed a unique Sequence of Construction that will allow us to schedule construction activities in multiple Areas concurrently. If we encounter a delay in one work Area, resources will be reallocated to another available Area to accelerate construction until resolution.

#### ■ Responding to COVID-19

We are committed to creating a safe work environment for workers and visitors to the I-81 Project site. The introduction of COVID-19 into the daily work routine compounds safety issues on project sites. To ensure safe construction operations, we will implement the JV's COVID-19 Exposure Prevention, Preparedness, and Response Plan (EPPRP), which we will follow throughout the Project's duration. We will vigilantly follow the EPPRP to mitigate the potential of COVID-19 impacts to the Project Schedule. Our Safety Manager will also continuously monitor the Project to ensure compliance with all current government mandates. Methods of providing a safe Project site currently include:

- The DBPM, in coordination with the construction manager and superintendents, will develop risk assessments identifying workplace hazards and job tasks that may present an exposure risk.
- Social distancing, face coverings, and other personal protective equipment (PPE) will be strictly enforced at all times.
- Clean and safe personal workspaces, common areas, and rest facilities at all times.
- COVID-19 training will be provided, facilitated, and documented for all workers.
- Constant evaluation of workplace conditions and recommendations regarding:
  - » PPE or face coverings.
  - » Occupancy of site buildings.
  - » Necessary social distancing.
  - » Installation of physical barriers.
  - » Placement of signs and notices.
- Methods the DBPM, in coordination with the construction manager, superintendents, and the construction JV's corporate safety professionals, will take to address employee concerns or questions about COVID-19.
- Proper PPE and sanitation supplies will always be readily available to all workers and site visitors.

## 4.5.2 Transportation Management Plan

Our Team has the knowledge, understanding, and experience developing Transportation Management Plans (TMPs) involving major interstate and bridge projects that safely and effectively manage both traffic during construction and communications with the stakeholders. This segment of I-81 is a critical transportation link, with an average daily traffic (ADT) volume that exceeds 64,000 vehicles per day (VPD). Volumes are higher during peak travel periods associated with recreational travel and major regional events, significantly associated with Virginia Tech and destinations south of the I-81 Project area.

There are limited alternate routes available, with Route 11/Route 460 through the City of Salem serving as the primary alternate route to I-81 through this area. I-81 is also an essential commercial truck route for the east coast. **Providing a safe and efficient work zone for the traveling public will enable our Team to construct the improvements effectively and is critical to the Project's overall success.** We will develop a comprehensive TMP, which will have the following three important elements:

- A Temporary Traffic Control Plan (TTCP).
- A Public Information and Communications Plan (PICP).
- An Incident Management Plan (IMP).

The TTCP will be developed following the *Virginia Work Area Protection Manual (VWAPM)*, all applicable VDOT standards, and Part 2 of the RFP. The TTCP will detail the phases of work, impacts to the travel way, haul routes, construction access, and other critical elements necessary to provide a safe and efficient work zone.

### KEY CONSIDERATIONS

The elements of the proposed TMP consider the varied users of the I-81 corridor. Our Conceptual Design accommodates heavy truck traffic, with WB-67 design vehicle turning movements used to establish required clear area during construction operations, as applicable. We understand the critical nature of the I-81 corridor and varying levels of traffic demand. **We acknowledge the specific holiday work restrictions in the limitation of operations and the additional critical dates identified in Section 2.10.3 of the RFP.** Our Project Schedule accounts for these critical volume periods when existing travel lanes must remain open to traffic.

#### ■ Maintaining Traffic throughout Construction

Our approach to MOT is focused first on safety for the traveling public and workers. As discussed previously

in Section 4.5.1, we have divided the corridor into four Project Areas. We developed this sequence of construction activities to ensure that traffic is maintained through the work zone. Elements of our construction phasing are provided behind "**TAB 1-C**" in Volume II and are discussed in the following narrative.

#### PHASE 1: NB AND SB CONSTRUCTION OPERATIONS

- **Key Elements:** Outside shoulder strengthening, SWM basin construction, utility relocations, bridge maintenance activities.
- **MOT:** Work along I-81 mainline and other facilities will be performed using temporary lane and shoulder closures in accordance with the allowable restrictions with the RFP.
  - » **Route 635 Roadway Profile Adjustment (Area of Focus):** The profile of Route 635 will be lowered to provide adequate clearance beneath the I-81 bridges crossing over this facility. In accordance with the RFP, a temporary closure and detour of Route 635 is proposed to facilitate this construction. Our plan also recognizes that Route 619 may not be subject to lane closures or short-term closures while Route 635 is temporarily closed and traffic is detoured.

#### PHASE 2: GRADING, DRAINAGE, BRIDGE REPLACEMENTS AND WIDENING IN THE MEDIAN

- **Key Elements:** After shifting traffic to the newly strengthened outside shoulders, begin work in the median including grading, drainage structures, utility relocations, placement of aggregate base and intermediate asphalt, and initial phase of the bridge reconstruction for the bridges over Route 112, Route 635, and Route 619) and bridge widening of the I-81 structures over Route 311. Additional details regarding our proposed construction sequence for structures is provided in Section 4.3.2.
- **MOT:** Temporary concrete barrier service will be installed along the right side of the I-81 travel lanes while work is progressing to the outside. The required 34' of clear roadway will be maintained, with the exception of bridge locations where there is not adequate room. In those locations, we will exceed the RFP minimum by providing 26' of clear roadway width between barriers. Temporary lane closures will be used when needed in accordance with the allowable hours in the RFP.

#### PHASE 3: GRADING, DRAINAGE, RETAINING WALLS, NOISE BARRIERS, BRIDGE REPLACEMENTS, AND ROADWAY WIDENING

- **Key Elements:** After shifting traffic to the newly constructed median, complete construction of widening and elements to the outside of the existing

roadway. This will include retaining walls and sound walls, the second (and final phase) of bridge reconstruction for the I-81 bridges over Route 112, Route 635, and Route 619) and the widening of the I-81 structures over Route 311. This phase will also include installation of the required lighting and ITS infrastructure within the Project limits and any reforestation and landscaping.

- **MOT:** Temporary concrete barrier service will be installed along the left side of the I-81 travel lanes while work is progressing in the median. We will exceed the RFP required 34' of clear roadway width and provide 12' travel lanes during this phase, with the exception of bridge locations where there is not adequate room. In those locations, we will exceed the RFP minimum by providing 26' of clear roadway width between barriers. Temporary lane closures will be used when needed in accordance with the allowable hours in the RFP.

#### PHASE 4: FINAL PAVING, PAVEMENT MARKERS, AND INSTALLATION OF SIGNAGE

- **Key Elements:** Once the major work elements are complete, install any remaining permanent Project signage, perform final paving of the surface course and install final pavement markings, and switch traffic to the final pattern.
- **MOT:** Work under this final phase will be performed using short-term lane closures as permitted in the RFP. In accordance with the RFP, a minimum of 14 days prior to implementation, we will submit to VDOT a work zone traffic impact assessment for all proposed phases of construction. Work zone access points will be designed to allow safe departure and entry into travel lanes.

#### ■ Closures, Detours, and Time of Day Restrictions

Our proposed approach satisfies all RFP requirements. Lane and ramp closure times will comply with Section 2.10.3 of the Technical Requirements analyses. We will submit supporting analysis and documentation to VDOT to request approval for modified lane closure hours. No detours of I-81 mainline traffic are proposed; thus, our phasing plan was developed to maintain two through lanes per direction along I-81.

As previously noted, we propose one long-term detour for the Project to facilitate lowering the roadway profile along Route 635. This will be accomplished within the allowable 60-day period when schools are not in session. Within the time frames allowed in the RFP, short-term ramp closures may be utilized to facilitate the improvements to the I-81 SB off-ramp to Route 112. If proposed detours are necessary, we will prepare a detour plan for VDOT's approval before implementation.

**■ Approach to Flagging Operations**

Minimal use of flagging is anticipated as part of this Project, and flagging operations will be constrained to the existing two-lane facilities crossing I-81. Flagging will be conducted by certified staff in accordance with the VWAPM, and we will utilize portable temporary rumble strips following VDOT's requirements.

**■ Lanes Widths and Work Zone Speed Reductions**

Our proposed approach satisfies RFP requirements in terms of the minimum lane and shoulder widths. We will provide the required minimum clear pavement width, including the required 11' lanes and left and right shoulder widths; our Team will exceed the minimum 24' clear opening requirements in the vicinity of existing bridges.

The work zone will be designed to accommodate the current posted speed limit of 60 MPH within the Project area, with appropriately designed lane shifts and buffer areas.

**MAJOR PROJECT STAKEHOLDERS**

The I-81 Project has many important stakeholders, each with concerns and priorities. **EXHIBIT 4.5-4** below includes a compilation of potential construction-related impacts to specific key stakeholders and our plans to eliminate or mitigate the effects. Our comprehensive PICP will manage public opinion, understanding, and support of the Project. Its primary objectives are to:

- Effectively inform, engage, and raise awareness across all interested stakeholders about the Project.
- Reduce impacts of the Project's construction on the residents and traveling public.
- Emphasize work zone safety during construction.
- Minimize potential opposition from the public.
- Acclimate the traveling public with changes in traffic patterns.
- Mitigate or remove potential issues that could affect the I-81 Project's successful delivery.
- Strengthen the Team's credibility.
- Build and sustain public acceptance, trust, and support for the I-81 Project.

**▶ EXHIBIT 4.5-4 | Stakeholder Communication Methods**

ITEM	NATURE OF IMPACT	BRANCH-ORDERS TEAM MITIGATION MEASURES
<b>VDOT</b>	Degraded relationship due to external pressure and complaints from residents and the traveling public.	<ul style="list-style-type: none"> <li>• Establish clear communication and coordination with VDOT.</li> <li>• Comprehensive Incident Management Plan to rapidly respond to incidents in the work zone and minimize impacts to traveling public.</li> </ul>
<b>Roanoke County</b>	Impacts to local residents due to construction.	<ul style="list-style-type: none"> <li>• Clear communication regarding upcoming work activities.</li> <li>• Ongoing coordination to address Citizen concerns.</li> </ul>
<b>Cities of Salem and Roanoke</b>	Impacts to local residents due to construction and diverted traffic due to incidents.	<ul style="list-style-type: none"> <li>• Clear communication regarding upcoming work activities.</li> <li>• Ongoing coordination to address Citizen concerns.</li> </ul>
<b>Utility Companies</b>	Potential loss of service during construction and cost of facility relocations.	<ul style="list-style-type: none"> <li>• Assign a dedicated Utility Coordinator to manage utility coordination and relocations.</li> <li>• Sequence construction operations to allow time for utility relocations.</li> <li>• Effective use of Miss Utility and SUE to locate and protect existing utilities.</li> </ul>
<b>First Responders</b>	Closures of roads used for emergency routes. Access of emergency vehicles in construction areas. Impacts to existing crossovers.	<ul style="list-style-type: none"> <li>• Provide signing before existing crossovers to alert police/EMS to location.</li> <li>• Post identification signs for all work zones.</li> <li>• Monthly coordination and direct line of communication with the IMC and MOT Manager, including review of upcoming schedule and MOT patterns.</li> </ul>
<b>Local Schools</b>	Noise pollution and traffic disruptions during construction. Safety concerns related to construction traffic.	<ul style="list-style-type: none"> <li>• Host a kickoff meeting with schools to promote awareness of construction activities.</li> <li>• Conduct construction activities without impacting buses and pedestrians.</li> <li>• Complete Route 635 detour when schools are not in session to minimize impacts.</li> </ul>
<b>Residential Areas and Neighborhood Associations</b>	Lack of access due to road closures. Noise and dust from construction.	<ul style="list-style-type: none"> <li>• Host a kickoff meeting so that all neighborhoods to can review the construction schedule and plans.</li> <li>• Issue news releases and provide PCMS boards in advance of any new construction activities.</li> <li>• Support VDOT as needed with coordination and responses to</li> </ul>
<b>Local Businesses/ Chamber of Commerce</b>	Traffic disruptions due to road closures. Restricted access due to construction activities.	<ul style="list-style-type: none"> <li>• Coordinate and inform businesses before any road closure(s) may affect them.</li> </ul>
<b>Churches, Parks, and Other Community Facilities</b>	Construction-related delays and traffic impacts as well as noise pollution.	<ul style="list-style-type: none"> <li>• Regular communication of all work activities and road closures.</li> <li>• Avoid working on Sundays or days of religious observance(s).</li> </ul>

The PICP will be developed in compliance with the VDOT Salem District requirements, and will function as a road map for all communications. The success of the Project can be affected by positive public opinion and stakeholder expectations. The development of a comprehensive public outreach program to efficiently educate, raise awareness, minimize impacts, and demonstrate the Project's advantages to key stakeholders would also serve as the cornerstone of the public communications program. A proactive communication plan consisting of a range of integrated communication tools will provide the necessary scope and frequency to positively engage and influence all stakeholders.

**Owen Peery, PE** is our dedicated Public Relations (PR) Manager. In close collaboration with VDOT Salem District Communications, Roanoke County, and the Cities of Roanoke and Salem, Mr. Peery will manage all public relations on the I-81 Project. He will work through VDOT to respond to media and public inquiries, provide VDOT with the Project's status, distribute traffic information to local media outlets, and plan and support the Incident Management Team.

Mr. Peery will supervise the development of graphics and materials including renderings, drawings, and sketches to help the public understand changes in traffic conditions and upcoming events. These materials will be prepared for use at stakeholder meetings as well as the project web site and other multi-media sites. Members of our Team will attend various stakeholder meetings at key points in the construction of the project. We will also provide up-to-date photographs of the Project site for media and web use on a monthly basis, as well as times when key construction events are taking place.

Throughout design and construction, Mr. Peery will provide support for the following activities:

#### ■ Support for Project Website and Social Media



We recognize that VDOT has developed the Improve 81 website to serve as a key point of access for the public seeking information about ongoing and planned improvement projects along the I-81 corridor. Our Team will support VDOT's development of Project-specific information to support the website, as well as others when needed.

#### ■ Media Relations and Print/Broadcast Materials



Our Team will assist with media relations. As needed, we will provide feature articles and broadcast interviews on the Project, traffic alerts, safe driving practices, and

Project updates as an integral component of the public outreach campaign to educate the public fully. We will also assist in developing brochures, fact sheets, quarterly newsletters, presentations, and multi-media advertisements that convey the benefits of the Project.

Assistance will be provided to VDOT in the distribution of materials via social media outlets, including regular Project updates, notices about significant upcoming traffic pattern changes, and providing updates during incidents. It is also important to notify the public of upcoming and completed Project milestones (e.g., completion of a major structural element or changes in the traffic pattern) to document the success and demonstrate to the public the Project's benefits and that ongoing progress is being made.

#### ■ Assistance with Public Meetings and Hearings



While the Design Public Hearing for the I-81 Project was held on February 9, 2021, our Team anticipates additional public information meetings to be scheduled regularly throughout the Project. These public informational meetings will provide Project partners, the public, and other stakeholders a platform for sharing Project updates, primary benefits, potential impacts, opinions, and potential concerns.

COVID-19 presents challenges for keeping the public aware of the construction. **Our Team is skilled at holding virtual public hearings for projects throughout Virginia.** We have supported VDOT with virtual public involvement opportunities, including formal public hearings such as the recent I-395/Boundary Channel Drive and I-81 Exit 313 Virtual Public Hearings. Members of the Team have also supported the Salem District with virtual public engagement for the US 460 STARS Study in the City of Roanoke and Roanoke County. **We are adept at preparing recorded meeting presentations and engaging with the public and stakeholders through virtual Q&A sessions.** We have seen increased engagement through these means, resulting in hearing a better cross-section of viewpoints on these projects. This increased engagement level will require detailed preparation, including rehearsals for live presentations and technology checks for all staff who will participate.

Our Team will develop a Crisis Communications/Risk Management Response Plan to anticipate and mitigate any potential concern or controversy. This Plan will be particularly critical on a busy corridor such as I-81, where major incidents may require special measures. The PR Manager will take the lead during these periods and work closely with VDOT to provide rapid, accurate information to the public and other stakeholders.

## PROJECT SITE COMMUNICATIONS

As part of the TTCP, our Team will leverage Portable Changeable Message Signs (PCMSs) approaching and within the Project area to notify the public of upcoming key work activities. This information will supplement the regular updates to VDOT for dissemination through various media and social media channels. PCMS boards will serve as an essential asset during incidents to provide supplemental real-time information to motorists and assist with implementing the specific action items from our IMP.

## PUBLIC SAFETY APPROACH

Our Team will develop an IMP that will outline plans for responding and managing incidents in the I-81 Project corridor. **We will develop the IMP in collaboration with VDOT, local EMS, and other stakeholders.** The Team will establish procedures about groups to notify in the case of an incident, including police coordination. Elements of our IMP are highlighted to the right in **EXHIBIT 4.5-5**.

Before construction begins in any work zone or lanes are closed, the IMP will be reviewed and approved by VDOT. This plan will consider the type of incident, its estimated duration, identify key members of the Team, and the measures needed to clear the incidents to meet Section 2.10.2 of Part 2 of the RFP. **The IMP will be a living document that will be continuously updated and modified based on the design development, stakeholder feedback, and lessons learned from previous incidents occurring in the Project limits.** It will demonstrate that the Team thoroughly manages all matters relating to incidents within the I-81 Project area.

## MANAGING INCIDENTS IN THE I-81 CORRIDOR

**David C. Scott** is our **Incident Management Coordinator (IMC)** and will direct the response to incidents. Mr. Scott, **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 IMP onsite implementation. He will ensure proper procedures and communication protocols are in place and facilitate communication with local first responders regarding any roadway conditions due to construction activities.

Mr. Scott will be available to respond during construction operations and respond to incidents within the I-81 Project work zone. He will be VDOT's point of contact for incident management and will apply National Incident Management System (NIMS) principles and practices throughout construction. He will designate a weekly time throughout construction operations to meet with stakeholders and review the IMP, anticipated schedule, concerns, and proposed changes.

## EXHIBIT 4.5-5 | Incident Management Plan

### Incident Management Plan Elements

#### Communication Plan Elements:

- ✓ A 24/7 point-of-contact for emergency notifications of incidents in the I-81 Project corridor.
- ✓ An Agency and Stakeholder Responsibilities Matrix/ Checklist that communicates Project needs and responsibilities.
- ✓ Methods of communication with the VDOT SWRO TOC, as well as all other stakeholders.
- ✓ A plan for communicating with all first responders and stakeholders in the project corridor.
- ✓ A contact list of all appropriate response personnel.

#### Implementation Plan Elements:

- ✓ VDOT-approved emergency detour routes, sign layout plans, and TMP signage.
- ✓ Sign layout and signing plans that show all previously staged detour equipment, and materials needs, emergency detour routes, crossovers, and access points.
- ✓ An up-to-date listing of all revisions and updates made to the design plans.
- ✓ Plans that demonstrate areas of access for law enforcement, fire, and rescue services during incidents.
- ✓ A listing of all programmed messages to be shown on the portable DMS boards during incidents.
- ✓ Simulated situational training drills so that Team members are ready to respond to incidents in the I-81 Project corridor.

Mr. Scott 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. 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.

We understand that maintaining mobility in the I-81 corridor is one of VDOT's major concerns. **Branch is currently working on the adjacent I-81 MM 141 to MM 143 Project.** This unparalleled experience enables our Team to anticipate the impacts of incidents on I-81, as well what is needed to respond to them accordingly.

## TEAM MEMBER HIGHLIGHT: Incident Management Coordinator

A successful IMC needs to be able to react calmly during emergencies and determining time-sensitive solutions under stress. Our IMC, David C. Scott, is a former law enforcement officer for the City of Roanoke Police Department. In addition to working for the City of Roanoke, Mr. Scott was also a Special Agent for the Virginia ABC Bureau of Law Enforcement. Because of this, he is very familiar with the I-81 corridor and its issues. He has demonstrated experience in traffic management and has been responsible for traffic control in and around the I-81 Project corridor during major traffic incidents, crowd control, significant weather events, natural disasters, crime scenes, and special events. Mr. Scott will report directly to the DBPM, will be on the Project site for the duration of construction operations, and will respond to all incidents within the Project limits. **Mr. Scott has all but one (FHWA SHRP2 "TIM" Responder Training) of the training and certifications required by the RFP for this role, as the training is not available until April 2021. This training will be completed before commencement of construction.**



David C. Scott  
 Branch Civil, Inc.

### TRAINING AND CERTIFICATIONS:

- FEMA ICS/NIMS 100, 200 & 700 (2021)
- FEMA/VDEM Hazardous Materials Awareness (2021)
- Department of Mineral Mining (2016)
- American Red Cross First Aid/CPR/AED Instructor (2018)
- EPRO Aerial Life, Scissor Lift Instructor (2012)
- DCJS Defensive Driving Instructor (2011)
- DCJS Academic Instructor (2005)
- Mounted Patrol Certification (2004)
- US Marshall Special Deputy



When responding to incidents, Mr. Scott will coordinate with wrecker services to ensure rapid response times to incident sites 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 I-81 Project site entirely. Emergency crossovers will be maintained, where practical, to allow law enforcement and other first responders to reach incident sites rapidly. Methods of communication between Mr. Scott and involved parties are highlighted to the right in **EXHIBIT 4.5-6**.

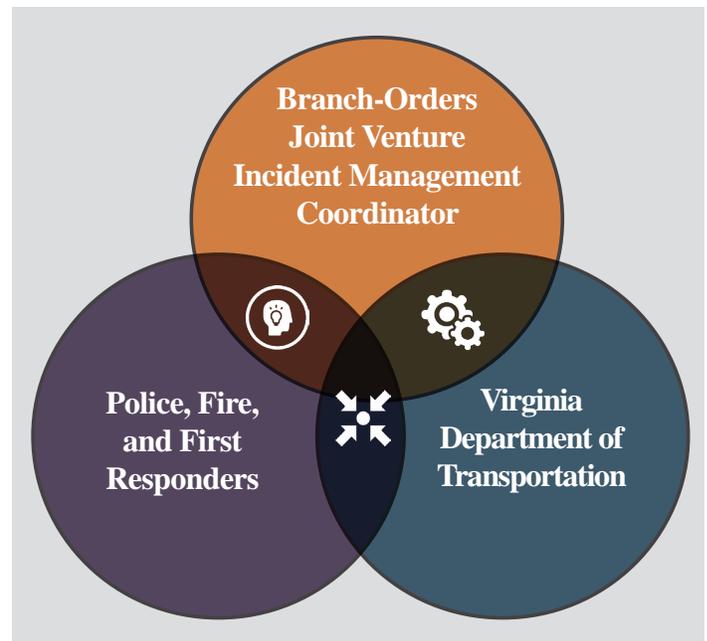
### EMERGENCY PULL-OFFS

Emergency pull-offs will be provided, where practical, within the work zone to allow motorists to exit the traffic stream in an incident safely. These designated locations will satisfy the RFP requirements for 15' of clear width on a stable surface. Doing so will also provide areas for wrecker services to remove vehicles and law enforcement to perform post-incident activities.

### DETOURS AND ALTERNATE ROUTES

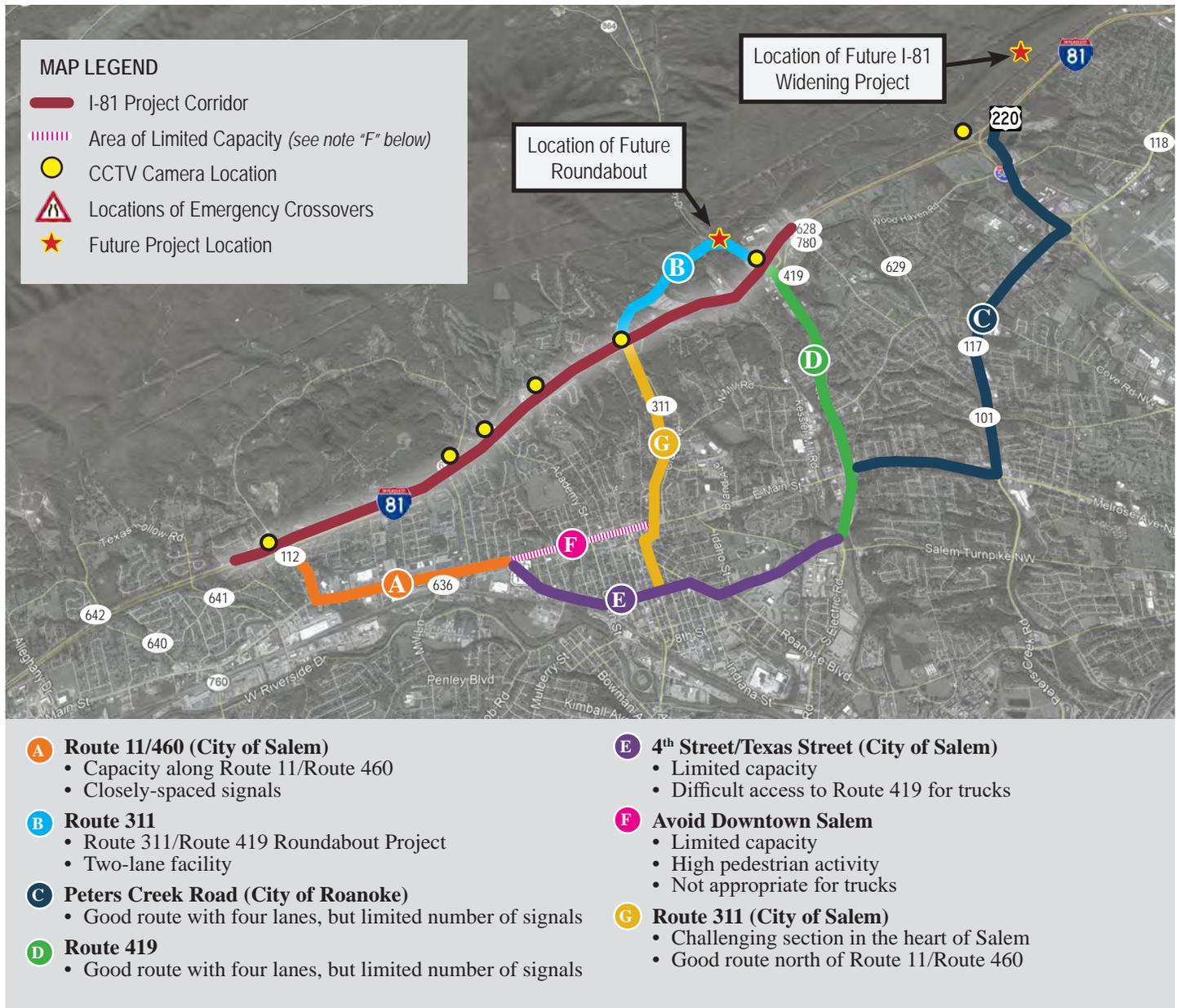
While our approach does not require detours for I-81 traffic, we recognize that a plan must be in place to move traffic if a major incident occurs within the work zone. As such, **the IMP will include detailed, actionable plans for implementing detours from I-81 to the available alternate routes.** These will build off the existing SWRO Freeway Traffic Management Incident Detour Plans from VDOT. However, our Team will work with VDOT to refine those plans for incident management via Exits 132, 137, 140, 141, and 143 (via I-581 and Peters Creek Road).

### EXHIBIT 4.5-6 | IMC Chain of Communication



As demonstrated in **EXHIBIT 4.5-7** on page 52, the primary alternate route through this segment is US 11/ US 460. Depending on the location and type of incident, a detour could pass through three different jurisdictions: Roanoke County, City of Salem, and the City of Roanoke, with traffic signals maintained by VDOT and the two cities. Therefore, development of a detailed incident plan will be critical. We will assign specific responsibilities to each entity and the IMC will lead the implementation of the plan during incidents.

**EXHIBIT 4.5-7** | Detours and Alternate Routes



**MOTORIST INFORMATION**

A vital element of the IMP will be integrating it with the overall PICP for the I-81 Project to ensure that motorists receive timely, accurate information while traveling through the construction zone. It is also essential to ensure that information is available in advance so motorists can prepare to use other needs when needed. The IMP will utilize the PCMS boards on the Project site to provide updated information to motorists while also leveraging existing VDOT Dynamic Message Signs along the I-81 corridor. Programmed message packages for different incident scenarios will be developed for deployment by VDOT's TOC.

**COORDINATION EFFORTS**

Regular coordination will be critical to the success of the IMP. **We recognize that incident management for this Project cannot exist in a vacuum – it will require input from VDOT, local governments, and other key stakeholders.** Regular partnering meetings will be held to collaborate on the plan, review the plan, and modify it as needed. Activities will include “after-action” meetings to discuss lessons learned and apply those to future actions. Our Team will coordinate with VDOT to understand ongoing projects along the I-81 corridor and ensure that our plan is consistent with nearby projects. These include, but are not limited to,

the proposed project between MM 144 and 150, which is anticipated to begin construction when the I-81 Project is underway. Major incidents from one project have the potential for impacting another. **We will work with VDOT to a proactive plan to effectively and efficiently handle any issue that may occur.**

### EFFORTS DURING DESIGN TO AVOID/MINIMIZE POTENTIAL SAFETY IMPACTS

Our Conceptual Design for the I-81 Project uses an integrated approach that includes the Team and VDOT. While the Design Team will use the *FHWA's Manual on Uniform Traffic Control Devices (MUTCD)* and the *Virginia Work Area Protection Manual (VWAPM)* in the development of the TTCP, there could be variables related to means and methods of construction that may require additional considerations in the design of the TTCP. Including the Construction Team in the early identification of these variables through the constructability review process and the weekly Technical Work Group meetings will allow the Design Team to incorporate and manage safety and mitigate undesirable conditions before finalizing the plans. By doing so, our Team will greatly improve the work zone's safety for construction personnel and the traveling public.

Of particular importance will be identifying locations for safe construction access to the median work area. Identifying safe locations to complete the Project efficiently will involve efforts from both Design and Construction Team members.

### EFFORTS DURING CONSTRUCTION TO AVOID/MINIMIZE POTENTIAL SAFETY IMPACTS

Our Team considers the safety of its employees and the general public to be a matter of prime importance. We will involve operations staff with their construction counterparts during the design process so that constructability and safety procedures go hand-in-hand with the design and Project Schedule development. Simultaneously, similar collaboration, coordination, and planning meetings amongst Design and Construction Team members and VDOT will also occur in the development of various portions of the Team's Final Design (e.g., TMP, PICP, among others). In all parts of this Design, we will establish procedures to carry out safety standards, such as ongoing police patrol, first responder, and incident response factors.

Collaboration between stakeholders will also be an essential aspect of developing safe and effective management plans; as previously noted, our IMP and IMC are fundamentals of this collaborative approach to overall safety along the Project corridor. Working in high traffic volumes with a high percentage of trucks involves many factors that need to be planned with

stakeholders' and workers' safety in mind. Our Team will proactively address possible hazards before they occur and will never compromise production and cost savings safety.

Because of mandatory VA 811 notifications, underground utilities will be similarly dealt with by identifying, labeling, and securing them to avoid hazardous situations, such as impacts to an unknown utility. Maintaining an impeccable safety record on the I-81 Project will be the primary objective for our Team. **At the end of each day, we will ensure workers return home to their families.**

We recognize the challenges of working within this segment of the I-81 corridor. Based on publicly available data, there were 565 crashes within the Project area during the preceding five years, plus numerous other incidents (including disabled vehicles, road debris, among others). The accidents occurred without the presence of a long-term work zone and the additional challenges that motorists encounter in this environment. We are prepared to rise to the challenge and ensure that the traveling public safety traverses the Project work zone day in and day out.

Our Team mandates that the most stringent safety guidelines are established and provide proven safety leadership, always starting at the organization's highest levels to attain zero incidents. During design, safety will be the primary driver in the development of the TTCP. During construction, we will emphasize public safety and reinforce travel expectations through work zones regularly to the appropriate audience. As motorists enter the work zone, the signs and markings will provide clear and easily understood guidance as they travel the I-81 Project alignment.

Our experience in the area guided the development of our TMP and MOT Plan to ensure congestion is reduced, allowing continuous and safe travel through the work zone. Our plan satisfies VDOT's requirements to provide a minimum 34' of clear pavement width (except for bridge structures). This width offers room for potential emergency stopping and additional buffer space for drivers to recover if they make a mistake. If incidents occur, we will perform after-action reviews and apply lessons to enhance safety further. Actions may include adjustments to the TTCP to reduce the risk of an incident or adjustments to the IMP to respond better when they do occur. Our approach to public safety will be proactive, starting from day one, and responsive to changing conditions and experience gained working within Project site.



# SECTION 4.6

## Proposal Schedule



# 4.6 PROPOSAL SCHEDULE

The Branch-Orders Team reviewed the schedule requirements in the RFP and prepared a Proposal Schedule and Proposal Narrative that demonstrates our understanding of the complexities and challenges of this critical Project.

## 4.6.1 Proposal Schedule

The Proposal Schedule utilizes 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. The schedule narrative is included in *Section 4.6.2* below, and the CPM Proposal Schedule is provided behind “**TAB 3**” in Volume II of our Technical Proposal. Per the RFP requirement, our Team has provided PDF copies of the Proposal Schedule and Narrative, as well as a back-up copy of the Proposal Schedule’s source document 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. The narrative includes overall sequencing of the Project, 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 Project in a total of three stages:

1. **DESIGN, UTILITIES, AND RIGHT-OF-WAY (ROW) ACQUISITIONS:** The objectives of this stage is to complete all preliminary and final design for the I-81 Project, resolve all utility conflicts, and perform ROW acquisitions.
2. **PERMITTING:** The objective of this stage is obtain all environmental permits from applicable agencies (e.g., DEQ, USACE, 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, punchlist, and closeout of the I-81 Project.

### CRITICAL MILESTONES

Our Team is committed to a **Final Completion Date of January 15, 2026**. **EXHIBIT 4.6-1** above identifies key procurement dates, which will require coordination between our Team and VDOT and other reviewing

### ▶ EXHIBIT 4.6-1 | Key Schedule Milestones

MILESTONE	DATE
Technical Proposal Submission	03/03/2021
Price Proposal Submission	03/30/2021
Opening of Price Proposal	03/30/2021
CTB Approval	04/21/2021
D-B Contract Execution	05/21/2021
Notice to Proceed	05/24/2021
Scope Validation Period	05/24/2021 to 09/20/2021
Start of Construction	09/23/2021
Final Completion	01/15/2026

agencies, including, but not limited to, Roanoke County, the City of Salem, and FHWA. Post-award, we will implement an assertive D-B approach, local experience, and relationships to potentially improve these dates.

### WORK BREAKDOWN STRUCTURE (WBS)

The WBS is a multi-level, hierarchical arrangement of the work performed on the I-81 Project. Our Team has laid out the WBS to breakdown the major work Areas of the I-81 Project by element and type of work.

Work has been broken down by Construction Areas, and respective components, including Schedule Milestones, Project Management, Scope Validation, Environmental/Permitting, ROW, Design, Utility Relocation/Coordination, and Construction. WBS areas for the I-81 Project were developed as a collaborative effort between the Design and Construction Teams by evaluating the components as a single project, including type of work along the alignments design considerations, and management of the construction efforts. Below is an outline of our WBS Structure, and a detailed breakdown is presented in **EXHIBIT 4.6-2** on page PS-2.

### ■ Administration

This section of the Proposal Schedule contains the Health, Safety, and Welfare Plan, as well as the Utility Relocation Plan, ROW Acquisition, and Project Schedule.

**EXHIBIT 4.6-2 | Work Breakdown Structure**

WBS CODE	WBS NAME
<b>C00116203DB108</b>	<b>I-81 WIDENING MM 136.6 - MM 141.8 PROPOSAL SCHEDULE</b>
<b>C00116203DB108.1</b>	<b>MILESTONES</b>
<b>C00116203DB108.4</b>	<b>DESIGN ACTIVITIES</b>
C00116203DB108.4.20	QA/QC Plan
C00116203DB108.4.15	Survey
C00116203DB108.4.16	Geotechnical
C00116203DB108.4.17	Environmental Permits
C00116203DB108.4.18	Utility Relocation/Coordination
C00116203DB108.4.24	Bridge Maintenance and Repair Plans
C00116203DB108.4.25	Bridge Design
C00116203DB108.4.19	Shoulder Strengthening Work Package
C00116203DB108.4.26	MOT, Grading, Drainage, E&SC/SWM, Water, Sewer, and ROW Work Package
C00116203DB108.4.27	ROW Acquisition
C00116203DB108.4.1	Noise Barriers
C00116203DB108.4.22	Final Design
C00116203DB108.4.21	Pavement Markings/Signage Plans
<b>C00116203DB108.2</b>	<b>PRELIMINARY ACTIVITIES</b>
<b>C00116203DB108.3</b>	<b>CONSTRUCTION ACTIVITIES</b>
<b>C00116203DB108.3.1</b>	<b>Phase 1</b>
C00116203DB108.3.1.1	I-81 Northbound
C00116203DB108.3.1.1.1	Area 1
C00116203DB108.3.1.1.2	Area 2
C00116203DB108.3.1.1.2.3	Route 635 Roadway Reconstruction
C00116203DB108.3.1.1.3	Area 3
C00116203DB108.3.1.1.3.1	I-81 over Route 311 Bridge
C00116203DB108.3.1.1.3.2	Route 705 over I-81 Bridge
C00116203DB108.3.1.1.4	Area 4
C00116203DB108.3.1.1.4.1	Route 419 over I-81 Bridge
C00116203DB108.3.1.2	I-81 Southbound
C00116203DB108.3.1.2.1	Area 4
C00116203DB108.3.1.2.1.1	Route 419 over I-81 Bridge
C00116203DB108.3.1.2.2	Area 3
C00116203DB108.3.1.2.2.1	I-81 Over Route 311 Bridge
C00116203DB108.3.1.2.2.2	Route 705 over I-81 Bridge
C00116203DB108.3.1.2.3	Area 2
C00116203DB108.3.1.2.4	Area 1
<b>00116203DB108.3.2</b>	<b>Phase 2</b>
C00116203DB108.3.2.5	I-81 Northbound
C00116203DB108.3.2.5.1	Area 1
C00116203DB108.3.2.5.1.1	I-81 over Route 112 Bridge
C00116203DB108.3.2.5.2	Area 2
C00116203DB108.3.2.5.2.1	I-81 over Route 635 Bridge
C00116203DB108.3.2.5.2.2	I-81 over Route 619 Bridge

**EXHIBIT 4.6-2** | Work Breakdown Structure (*continued*)

WBS CODE	WBS NAME
C00116203DB108.3.2.5.3	Area 3
C00116203DB108.3.2.5.3.1	I-81 over Route 311 Bridge
C00116203DB108.3.2.5.4	Area 4
C00116203DB108.3.2.1	I-81 Southbound
C00116203DB108.3.2.1.4	Area 1
C00116203DB108.3.2.1.4.1	I-81 over Route 112 Bridge
C00116203DB108.3.2.1.3	Area 2
C00116203DB108.3.2.1.3.1	I-81 over Route 619 Bridge
C00116203DB108.3.2.1.3.2	I-81 over Route 635 Bridge
C00116203DB108.3.2.1.2	Area 3
C00116203DB108.3.2.1.2.1	I-81 over Route 311 Bridge
C00116203DB108.3.2.1.1	Area 4
<b>C00116203DB108.3.3</b>	<b>Phase 3</b>
C00116203DB108.3.3.1	I-81 Northbound
C00116203DB108.3.3.1.1	Area 1
C00116203DB108.3.3.1.1.1	I-81 over Route 112 Bridge
C00116203DB108.3.3.1.2	Area 2
C00116203DB108.3.3.1.2.1	I-81 over Route 635 Bridge
C00116203DB108.3.3.1.2.2	I-81 over Route 619 Bridge
C00116203DB108.3.3.1.3	Area 3
C00116203DB108.3.3.1.3.1	I-81 over Route 311 Bridge
C00116203DB108.3.3.1.4	Area 4
C00116203DB108.3.3.5	I-81 Southbound
C00116203DB108.3.3.5.1	Area 4
C00116203DB108.3.3.5.2	Area 3
C00116203DB108.3.3.5.2.1	I-81 over Route 311 Bridge
C00116203DB108.3.3.5.3	Area 2
C00116203DB108.3.3.5.3.1	I-81 over Route 619 Bridge
C00116203DB108.3.3.5.3.2	I-81 over Route 635 Bridge
C00116203DB108.3.3.5.4	Area 1
C00116203DB108.3.3.5.4.1	I-81 over Route 112 Bridge
<b>C00116203DB108.3.4</b>	<b>Phase 4</b>
C00116203DB108.3.4.1	I-81 Northbound
C00116203DB108.3.4.1.1	Area 1
C00116203DB108.3.4.1.2	Area 2
C00116203DB108.3.4.1.3	Area 3
C00116203DB108.3.4.1.4	Area 4
C00116203DB108.3.4.2	I-81 Southbound
C00116203DB108.3.4.2.1	Area 4
C00116203DB108.3.4.2.2	Area 3
C00116203DB108.3.4.2.3	Area 2
C00116203DB108.3.4.2.4	Area 1
<b>C00116203DB108.5</b>	<b>Completion Activities</b>

■ **Design Activities**

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; bridge, retaining wall, and sound wall design; ROW acquisitions; maintenance of traffic (MOT); grading; clearing and erosion and sediment control (E&SC) work package; lighting/sign/stripping design; intelligent transportation systems (ITS); and roadway design. Submittal milestones and approvals by VDOT and governing agencies are included.

■ **Design – Right-of-Way**

This section of the Proposal Schedule outlines and monitors the acquisition of ROW and easements, including title searches, appraisals and reviews, offers, negotiations, settlements, and filing certificates of take (COT) when needed. Prioritized groupings of properties are included on the second level WBS. These groups will enable our Team to focus efforts on the most critical acquisitions and will provide the ability to track these acquisitions to ensure on-time completions.

■ **Design – Environmental**

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

■ **Utility Relocations**

This section includes activities for Utility Field Inspection (UFI) meetings, completion of relocation designs, approval of relocation designs, and construction of the utility relocations. Utility relocations are separated into a second level WBS structure based on the utility owner and construction Work Area.

■ **Construction**

This section include all roadway, bridge, ITS, lighting, signage, retaining walls, noise barriers, and drainage construction components and includes project management. *Activity durations account for QA/QC inspections/testing, and hold/witness points.* This portion of the Proposal Schedule is segmented into additional WBS structure levels to divide the construction activities into Areas that can be easily managed and tracked to ensure a timely Final Completion.

**WORK CALENDARS**

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

- **Calendar 1 | 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 2 | Calendar Days:** Will be assigned to activities that have 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 Adverse Weather:** Will be used for construction activities that are anticipated to be affected due to adverse weather condition. The local average range of precipitation and cold weather data was considered while assuming this information.

For weather analysis, our Team has reviewed the weather data provided by the NOAA observation center located in Blacksburg, Virginia. **EXHIBIT 4.6-3** depicts 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*. In addition, we will observe the following work restrictions listed in the RFP:

- Virginia Tech Graduation
- Virginia Tech Move-in Days
- Radford University Graduation
- Virginia Tech Home Football Games
- Radford University Graduation
- Radford University Move-in Days
- Salem Fair
- Olde Salem Days
- Roanoke College Graduation

**OVERALL PLAN AND STRATEGY**

Our Team will develop a comprehensive plan to complete the I-81 Project in a timely and professional manner. 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.

► **EXHIBIT 4.6-3** | Anticipated Weather Days

MONTH & NUMBER OF ANTICIPATED WEATHER DELAYS	J	F	M	A	M	J	J	A	S	O	N	D
	8	8	7	6	6	4	2	2	2	3	5	8

Our Team will strategically divide design and construction into four geographic Construction Areas. This will allow the I-81 Project to geographically align the design packages with Project segments and streamlines the design-to-construction process. Our segmentation of the I-81 Project allows the design for each Construction Area to be developed concurrently with minimal schedule dependency on the other Areas and a high level of coordination between each. Design packages for each Construction Area will be submitted for VDOT review in accordance with the RFP requirements and Approved for Construction (AFC) design completion stage, ensuring comprehensive VDOT oversight while maintaining design progress.

The Proposal Schedule incorporates all phases of design including preparation, design QA/QC reviews, and submission of roadway, ROW, drainage, storm-water 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 pursuant to Notice to Proceed (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 early in the design process facilitates the timely issuance of environmental permits. Additionally, consistent communication within our Team and resource agencies helps mitigate risk to the I-81 Project Schedule.

Our approach during design includes 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 Conceptual Design. We will conduct fieldwork and technical services as necessary. They may include wetland delineation reconfirmation, stream assessments, threatened and endangered (T&E) species reviews, environmentally sensitive areas (ESAs), asbestos inspections on structures, and a final noise analysis that will be utilized for permitting and environmental compliance monitoring. If our refinement identifies unanticipated or unknown resources, the Conceptual Design will be modified to support avoidance and/or minimization opportunities. Our Team will coordinate with the appropriate resource agency(ies) to ensure resource protection if any new resources are 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 Conceptual Design is entirely within the RFP Design's footprint, the previously concluded Section 106 effect determination of No Effect, determined on July 28, 2020, should remain valid. Per the RFP, our Team will consider the three identified historic properties along the project limits to be design constraints and will avoid impacting them beyond what is included in the RFP Design. These properties include the Virginia Baptist Children's Home/Hope Tree, Hanging Rock Battlefield, and Freeman Cemetery. **We will avoid any other Project-related activities on or within the viewshed of the three historic properties identified in the RFP, including but not limited to staging, borrow/disposal, and any temporary or permanent easements.** We understand that any changes beyond the RFP Design may require additional cultural resources studies or coordination with the Virginia State Historic Preservation Office (SHPO).

### 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 August 21, 2020, identified two species that the Project would have no effect: the Roanoke logperch and orangefin madtom. This Form stated that the proposed Project may affect, but is not likely to adversely affect, the Indiana bat and northern long-eared bat. However, VDOT's June 2020 acoustic survey for T&E bats did not detect the presence of Indiana bat or northern long-eared bat. Additionally, the survey report concluded that a time-of-year restriction for tree cutting will not be required for the Project as long as all tree cutting occurs during the five-year time frame the survey is valid.

Per the RFP, no bridge bat inventories will be required within the five-year time frame the acoustic survey is valid. 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

Our Team refined the RFP Design to avoid and minimize impacts to streams. The RFP Design resulted in impacts to 0.31 acres (AC) of wetlands and 1,120 LF feet of streams. **Our Conceptual Design was refined to avoid impacts to 25 LF of streams through headwall modification.** This modification also eliminates floodplain impacts for the Project. As the design advances following the receipt of an NTP, we will look for additional ways to improve our Conceptual Design to avoid and further reduce impacts.

The Project will require authorization under a Virginia Water Protection General Permit 3 (up to 1,500 LF and 2 acres of wetlands) and an Individual Permit from the US Army Corps of Engineers (USACE). **If impacts can be reduced to less than 0.5 acres of wetlands and 1,000 LF of streams, the Project would be authorized under a Nationwide Permit 23 for approved Categorical Exclusions.** The Project will cross four named streams: Horners Branch, Dry Creek, Gish Branch, and Mason Creek. Mason Creek has a drainage area greater than 5 square miles; therefore, a Virginia Marine Resources Commission (VMRC) permit will be necessary.

### ■ ROW 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 ROW including title research, appraisals, offers, and negotiations. Except for permanent utility easements (yet to be identified) and possible temporary construction easements, our Team proposes the Project alignment will be contained within the ROW limits shown on the RFP Plans. To that extent, we will advance the ROW acquisition in accordance with the guidelines established by VDOT and other Commonwealth and federal guidelines.

The ROW activities shown on 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 NTP for ROW 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 duration of the entire Project.

### ■ Utilities

Sections 4.3.1 and 4.4.2 lists a portion of anticipated utility relocations and potential conflicts for the Project. The utility companies that have been identified as having facilities in the Project area are: Appalachian Power; Citizen's Telephone; Comcast; Roanoke Gas; Salem City Electric; Salem City Water and Sewer; Segra; Verizon; Western Virginia Water and Sewer; and Zayo Communications. Additionally, Osprey Fiber has agreements with VDOT for future fiber installation in the project area. Mitigation strategies to ensure the timely relocation of the facilities found to be in conflict will start with a consistent communication with the utility contacts to remind them of their schedule commitments and to ensure that they have their preliminary steps underway to complete the work. A detailed Utility Matrix is provided behind "**TAB 2**" of Volume

II. The locations and magnitude of these impacts are reflected accordingly in the Proposal Schedule.

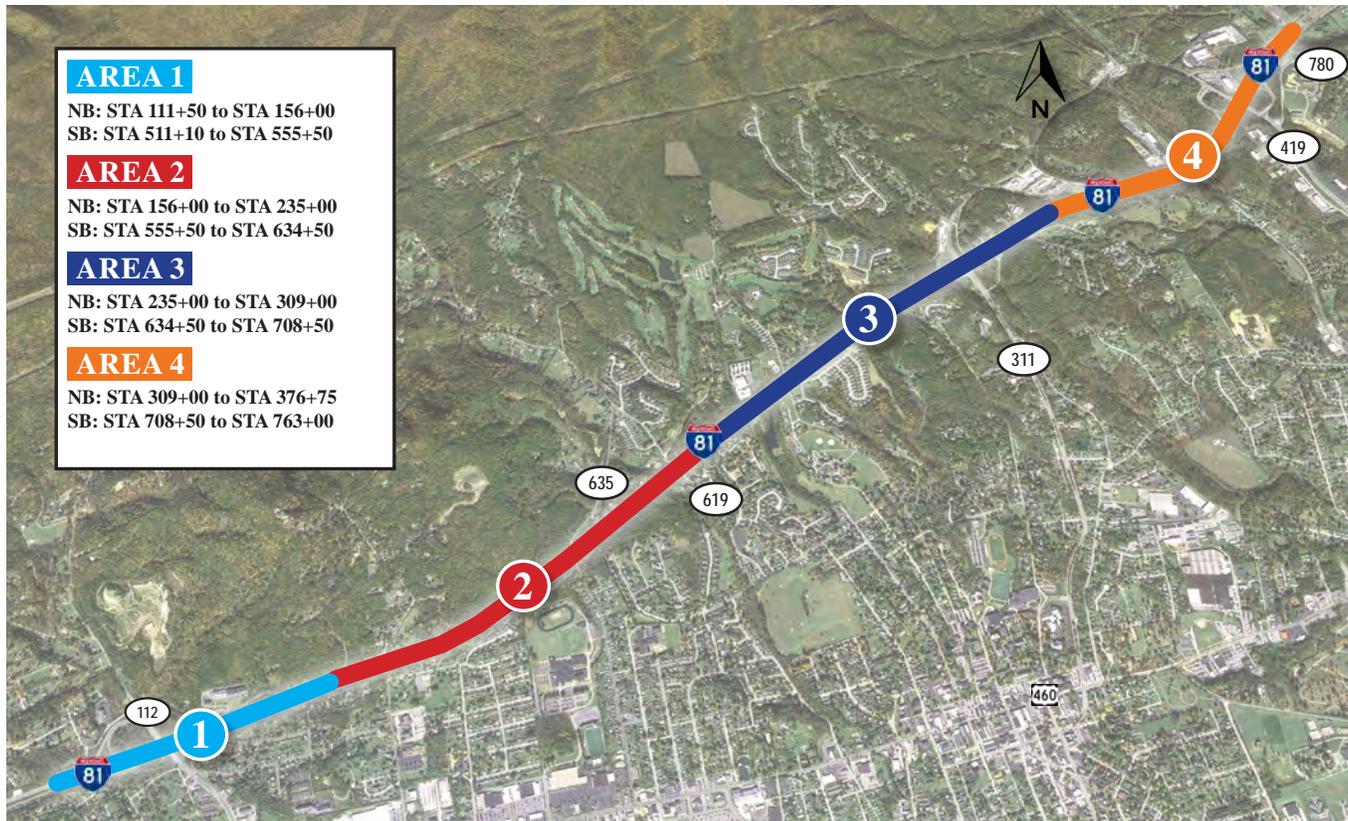
### ■ Overall Construction of the Project

Our Team developed an overall plan for construction through an intimate knowledge of the local area. **All key Team members reside in the Project area, and many use the Project corridor in their daily commute.** As demonstrated in **EXHIBIT 4.6-4** on page PS-7, construction operations are organized logically and systematically into four Project Areas, each containing relatively similar scopes of work and shorter activity durations. **This Project Area breakdown provides phasing flexibility and will allow the Team to advance to the next Phase when the previous Phase is completed.** We will perform work within each Project Area concurrently to achieve a Final Completion Date of January 15, 2026. **Our approach simplifies construction and enhances schedule flexibility to ensure on-time, on-budget delivery of the I-81 Project.** Our Conceptual Design 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 is provided below.

### ■ Phase 1 Construction Operations

Phase 1 will include preparatory operations on I-81 NB and SB lanes. The following will occur during this phase:

- Establish centralized staging areas and mobilize.
- Perform right shoulder strengthening throughout the entire Project corridor, both NB and SB as required, to facilitate traffic shift and Phase 2 construction. These activities will be performed at night under temporary lane closures and by progressing through all areas, which efficiently allows for linear progression and repetition of activities.
- Construct stormwater management basins working behind the existing guardrail at wider shoulder areas or from alternate access points. This will ensure that all necessary erosion and sediment control (E&SC) measures are in place prior to any land disturbing activities in later Phases.
- Remove and relocate existing utilities located in the median.
- Establish the required ROW so that necessary adjustments can be secured well in advance of Phase 3 work.
- Lower the existing roadway profile on Route 635 under I-81 to preclude conflicts with schedule restrictions for this work.
- Perform Early Work Packages in areas where there are no utility conflicts or environmental issues. Activities will include maintenance work on the following bridges:


**EXHIBIT 4.6-4** | Project Areas Map


■ **Area 3: Bridge B682 (Route 705 Bridge over I-81)**

- » Installation of embedded galvanic anodes.
- » Concrete substructure surface repair.
- » Concrete surface protection.

■ **Area 3: Bridge B677 and B678 (I-81 over Route 311)**

- » Installation of embedded galvanic anodes.
- » Concrete substructure surface repair.
- » Concrete crack repair (Type B).
- » Steel crack repairs (welding).

■ **Area 4: Bridge B681 (Route 419 Bridge over I-81)**

- » Installation of embedded galvanic anodes.
- » Concrete substructure surface repair.
- » Concrete surface protection.

- Perform temporary paving before utility relocations take place.
- Establish temporary MOT for switch to Phase 2 (e.g., temporary barrier service, construction signs, temporary pavement markings, among others) within the mainline corridor and shift traffic onto the strengthened shoulder both NB and SB. It is planned for these operations to be performed in a stacked linear progression through all areas to attain greater efficiency, with crews and subcontractors performing repetitive tasks.

■ **Phase 2 Construction Operations**

Phase 2 will include grading and drainage; construction of new bridge and miscellaneous structures; and roadway widening in the median. The following will take place during this phase:

- Establish construction access to the median through entire Project and set up satellite staging locations for on-site distributions.
- Clear and grub the work area, which will include the demolition or removal of any conflicting existing roadway elements.
- Perform remaining utility coordination and relocations not completed in Phase 1.
- Perform all median grading and drainage and permanent median barrier construction throughout all four Construction Areas to the final proposed roadway and bridge alignments.
- Perform partial demolition and construct temporary shoring and new bridge structures to the median at the following:

■ **Area 1: Bridges B683 and B688 (I-81 over Route 112)**

- » Partial superstructure/substructure removal.
- » Installation of temporary shoring.
- » Construction of MSE walls and abutments on driven steel piles.
- » Pier construction on micropiles.

- » Installation of new structural steel girders.
  - » Construction of new deck, approach slabs, and parapet.
  - **Area 2: Bridges B684 and B685 (I-81 over Route 635)**
    - » Partial superstructure/substructure removal.
    - » Installation of temporary shoring.
    - » Construction of MSE walls and abutments on driven piles.
    - » Installation of new structural steel girders.
    - » Construction of new deck, approach slabs, and parapet.
  - **Area 2: Bridges B686 and B687 (I-81 over Route 619)**
    - » Partial superstructure/substructure removal.
    - » Installation of temporary shoring.
    - » Construction of MSE walls and abutments on driven piles.
    - » Installation of new structural steel girders.
    - » Construction of new deck, approach slabs, and parapet.
  - Widening to the median of the following existing structures will also be performed in Phase 2:
    - **Project Area 3: Bridges B677 and B678 (I-81 over Route 311 NB)**
      - » Partial removal of the substructure and superstructure.
      - » Installation of temporary shoring.
      - » Construction of cast-in-place abutments on driven piles.
      - » Installation of new structural steel girders.
      - » Construction of new deck, approach slabs, and parapet.
      - » HES Patching Type B, Type A Hydro-Demolition, and latex overlay.
  - Place stone base and pavement structure up to the intermediate asphalt layer throughout, thereby only leaving surface asphalt and permanent pavement markings to be completed in Phase 4.
  - Establish temporary MOT for switch to Phase 3 (e.g., temporary barrier service, construction signs, temporary pavement markings, among others) and switch traffic from right shoulder to the median throughout.
- **Phase 3 Construction Operations**
- Phase 3 will include grading and drainage; construction of retaining walls and noise barriers; replacement of bridges; and roadway widening. The following will take place during this phase:
- Clear and grub the work area, which will include demolition or removal of any conflicting existing roadway elements.
  - Perform any necessary ramp reconstruction work to include tie-ins with secondary routes at interchanges.
  - Perform all right shoulder side grading/drainage and permanent barrier construction throughout building to the final proposed section and structures.
  - Install of guardrail and permanent sign structures along the right shoulder.
  - Construct all proposed retaining walls.
  - Construct sound walls throughout the Project.
  - Perform remaining demolition and replacement of the following structures:
    - **Area 1: Bridges B683 and B688 (I-81 over Route 112)**
      - » Full removal of existing structure.
      - » Installation of temporary shoring.
      - » Construction of MSE walls and abutments on driven steel piles.
      - » Pier construction on micropiles.
      - » Construction of new structural steel girders.
      - » Construction of new deck, approach slabs, and parapet.
    - **Area 2: Bridges B684 and B685 (I-81 over Route 635)**
      - » Full removal of existing structure.
      - » Installation of temporary shoring.
      - » Construction of MSE walls and abutments on driven steel piles.
      - » Construction of new structural steel girders.
      - » Construction of new deck, approach slabs, and parapet.
    - **Area 2: Bridges B686 and B687 (I-81 over Route 619)**
      - » Full removal of existing structure.
      - » Installation of temporary shoring.
      - » Construction of MSE walls and abutments on driven steel piles.
      - » Construction of new structural steel girders.
      - » Construction of new deck, approach slabs, and parapet.
  - Perform widening and rehabilitation of the following structures:
    - **Area 3: Bridges B677 and B678 (I-81 over Route 311 NB)**
      - » Removal and replacement of overhang and parapet.
      - » Construction of new structural steel girders.
      - » Construction of new deck, approach slabs, and parapet.
      - » Backwall and joint reconstruction.
      - » HES Patching Type B, Type A Hydro-Demolition, and latex overlay.
      - » Replacement of existing beam bearings.
  - Installation and integration of roadway lighting and ITS.
  - Complete reforestation and landscaping throughout the Project.
  - Perform staged removal of temporary MOT items 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, and installation of signage will occur. The following will take also place:

- Perform final paving and installation of pavement markings in all Project Areas.
- Install permanent signage in all Project Areas.
- Convert any temporary sediment basins designated to remain as a stormwater management structure to their permanent configuration.
- Switch traffic into its final pattern.

### CRITICAL PATH

As demonstrated in **EXHIBIT 4.6-5**, which begins on page PS-10, 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 Team's 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 to make sure critical activities are completed 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 the Team, VDOT, Roanoke County, the City of Salem, 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 are reliant on prompt reviews by VDOT.
- **Weather Impacts:** Our Team used weather data provided by the NOAA Station in Blacksburg, 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 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 the Construction Manager and DBPM, 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 Conceptual Design 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 clearly communicated to all involved parties throughout the duration of the I-81 Project.

EXHIBIT 4.6-5 | Overview Project Schedule

C00116203DB108		I-81 Widening MM 136.6 - MM 141.8 Proposal Schedule					03-01-21 10:46												
Activity ID	Activity Name	Original Duration	Start	Finish	2021 2022 2023 2024 2025 2026 2027 2028 2029 2030														
					Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		
<b>I-81 Widening MM 136.6 - MM 141.8 Proposal Schedule</b>					949	03-03-21	01-15-26	01-15-26, I-81 Widening MM 136.6 - MM 141.8 Proposal Sche											
<b>MILESTONES</b>					1780	03-03-21	01-15-26	01-15-26, MILESTONES											
M20	MILESTONE: TECHNICAL PROPOSAL DUE	0	03-03-21		MILESTONE: TECHNICAL PROPOSAL DUE, 03-03-21														
M40	MILESTONE: ANTICIPATED NTP	0	05-24-21		MILESTONE: ANTICIPATED NTP, 05-24-21														
M70	MILESTONE: CONTRACT COMPLETION (01/15/2026)	0		01-15-26*	MILESTONE: CONTRACT COMPLETION (01/15/2026),														
<b>DESIGN ACTIVITIES</b>					199	05-24-21	06-01-22	06-01-22, DESIGN ACTIVITIES											
<b>QA/QC Plan</b>					0														
<b>Survey</b>					0														
<b>Geotechnical</b>					0														
<b>Environmental Permits</b>					0														
<b>Utility Relocation/Coordination</b>					0														
<b>Bridge Maintenance and Repair Plans</b>					0														
<b>Bridge Design</b>					0														
<b>Shoulder Strengthening Work Package</b>					0														
<b>MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW Work Package</b>					76	05-24-21	09-09-21	09-09-21, MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW Work Package											
D1950	Design of MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW	65	05-24-21	08-24-21	Design of MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW														
D1960	QA/QC Review of MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW Plans	10	08-25-21	09-08-21	QA/QC Review of MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW Plans														
D1970	Prepare MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW Plans for Submission	1	09-09-21	09-09-21	Prepare MOT, Grading, Drainage, ESC/SWM, Water, Sewer and ROW Plans for Submission														
<b>Right of Way Acquisition</b>					132	09-10-21	06-01-22	06-01-22, Right of Way Acquisition											
D2030	R/W Authroization, Appraisals/BARS	60	09-10-21	11-08-21	R/W Authroization, Appraisals/BARS														
D2040	Independent Appraisal Review	20	11-09-21	12-07-21	Independent Appraisal Review														
D2050	Submit Appraisal/BARS Package to VDOT	2	12-08-21	12-09-21	Submit Appraisal/BARS Package to VDOT														
D2060	VDOT Review	21	12-10-21	12-30-21	VDOT Review														
D2070	Negotiations	30	12-30-21	02-14-22	Negotiations														
D2080	Final Negotiations Submission	30	02-14-22	03-29-22	Final Negotiations Submission														
D2090	VDOT Review and Funding	21	03-30-22	04-19-22	VDOT Review and Funding														
D2100	Closing/Condemnation	30	04-19-22	06-01-22	Closing/Condemnation														
<b>Noise Walls</b>					0														
<b>Final Design</b>					0														
<b>Pavement Markings/Signage Plans</b>					0														
<b>PRELIMINARY ACTIVITIES</b>					0														
<b>CONSTRUCTION ACTIVITIES</b>					695	05-11-22	11-14-25	11-14-25, CONSTRUCTION ACTIVITIES											
<b>PHASE 1</b>					24	05-11-22	06-24-22	06-24-22, PHASE 1											
<b>I-81 NB</b>					14	05-11-22	06-06-22	06-06-22, I-81 NB											
<b>AREA 1</b>					5	05-11-22	05-20-22	05-20-22, AREA 1											
1880	SWM Basin (147+50 - 149+50) (I-81 NB) (Area 1) (Phase 1)	5	05-11-22	05-20-22	SWM Basin (147+50 - 149+50) (I-81 NB) (Area 1) (Phase 1)														
<b>AREA 2</b>					9	05-23-22	06-06-22	06-06-22, AREA 2											
1920	SWM Basin (161+00 - 165+00) (I-81 NB) (Area 2) (Phase 1)	3	05-23-22	05-25-22	SWM Basin (161+00 - 165+00) (I-81 NB) (Area 2) (Phase 1)														
1930	SWM Basin (Sta. 182+00 - 188+00) (I-81 NB) (Area 2) (Phase 1)	6	05-27-22	06-06-22	SWM Basin (Sta. 182+00 - 188+00) (I-81 NB) (Area 2) (Phase 1)														
<b>RTE. 635 ROADWAY RECONSTRUCTION</b>					0														
<b>AREA 3</b>					0														
<b>AREA 4</b>					0														
<b>I-81 SB</b>					10	06-07-22	06-24-22	06-24-22, I-81 SB											
<b>AREA 4</b>					0														
<b>AREA 3</b>					0														
<b>AREA 2</b>					7	06-07-22	06-20-22	06-20-22, AREA 2											
2275	SWM Basin (Sta. 574+00 - 576+75) (I-81 SB) (Area 2) (Phase 1)	3	06-07-22	06-13-22	SWM Basin (Sta. 574+00 - 576+75) (I-81 SB) (Area 2) (Phase 1)														
2285	SWM Basin (Sta. 599+00 - 602+50) (I-81 SB) (Area 2) (Phase 1)	4	06-14-22	06-20-22	SWM Basin (Sta. 599+00 - 602+50) (I-81 SB) (Area 2) (Phase 1)														
<b>AREA 1</b>					3	06-21-22	06-24-22	06-24-22, AREA 1											
2325	SWM Basin (527+00 - 530+00) (I-81 SB) (Area 1) (Phase 1)	3	06-21-22	06-24-22	SWM Basin (527+00 - 530+00) (I-81 SB) (Area 1) (Phase 1)														
<b>PHASE 2</b>					317	06-27-22	02-01-24	02-01-24, PHASE 2											

█ Actual Level of Effort    █ Remaining Work    ◆ Milestone  
█ Actual Work    █ Critical Remaining Work    ▶ summary



EXHIBIT 4.6-5 | Overview Project Schedule

C00116203DB108		I-81 Widening MM 136.6 - MM 141.8 Proposal Schedule										03-01-21 10:46												
Activity ID	Activity Name	Original Duration	Start	Finish	2021		2022		2023		2024		2025		2026		2027		2028		2029		2030	
					Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
3295	Install Asphalt Base Course (I-81 SB) (Area 4) (Phase 2)	15	11-29-23	01-02-24																				
3305	Install Asphalt Intermediate Course (I-81 SB) (Area 4) (Phase 2)	5	01-03-24	01-15-24																				
3315	Install Guardrail (I-81 SB) (Area 4) (Phase 2)	6	01-08-24	01-17-24																				
3325	Remove Temporary Concrete Barrier (I-81 SB) (Area 4) (Phase 2)	4	01-22-24	01-29-24																				
3335	Establish Temp. MOT/Shift Traffic (I-81 SB) (Area 4) (Phase 2)	3	01-30-24	02-01-24																				
<b>PHASE 3</b>		<b>222</b>	<b>02-05-24</b>	<b>04-04-25</b>																				
<b>I-81 NB</b>		<b>0</b>																						
<b>I-81 SB</b>		<b>222</b>	<b>02-05-24</b>	<b>04-04-25</b>																				
<b>AREA 4</b>		<b>64</b>	<b>02-05-24</b>	<b>06-11-24</b>																				
5515	Install Temporary Concrete Barrier (I-81 SB) (Area 4) (Phase 3)	5	02-05-24	02-13-24																				
5525	Grading/Excavation (I-81 SB) (Area 4) (Phase 3)	6	02-08-24	02-20-24																				
5535	Install Storm Drainage (I-81 SB) (Area 4) (Phase 3)	36	02-15-24	04-29-24																				
5565	Install Aggregate Base Course (I-81 SB) (Area 4) (Phase 3)	18	03-29-24	05-02-24																				
5575	Install Asphalt Base Course (I-81 SB) (Area 4) (Phase 3)	15	05-03-24	05-31-24																				
5585	Install Asphalt Intermediate Course (I-81 SB) (Area 4) (Phase 3)	5	06-03-24	06-10-24																				
5595	Install Guardrail (I-81 SB) (Area 4) (Phase 3)	5	06-04-24	06-11-24																				
<b>AREA 3</b>		<b>89</b>	<b>06-13-24</b>	<b>10-31-24</b>																				
5625	Install Temporary Concrete Barrier (I-81 SB) (Area 3) (Phase 3)	5	06-13-24	06-20-24																				
5635	Grading/Excavation (I-81 SB) (Area 3) (Phase 3)	9	06-18-24	07-02-24																				
5665	Install Median Barrier (I-81 SB) (Area 3) (Phase 3)	5	09-05-24	09-12-24																				
5675	Install Aggregate Base Course (I-81 SB) (Area 3) (Phase 3)	24	09-13-24	10-18-24																				
5685	Install Asphalt Base Course (I-81 SB) (Area 3) (Phase 3)	19	09-24-24	10-22-24																				
5695	Install Asphalt Intermediate Course (I-81 SB) (Area 3) (Phase 3)	6	10-24-24	10-31-24																				
5705	Install Guardrail (I-81 SB) (Area 3) (Phase 3)	5	10-25-24	10-31-24																				
5715	Construct Retaining Wall (Sta. 660+50 - 664+50) (I-81 SB) (Area 3) (Phase 3)	15	07-03-24	07-26-24																				
5735	Construct Retaining Wall (Sta. 669+25 - 670+00) (I-81 SB) (Area 3) (Phase 3)	5	07-29-24	08-02-24																				
5745	Construct Retaining Wall (Sta. 691+00 - 701+50) (I-81 SB) (Area 3) (Phase 3)	20	08-05-24	09-04-24																				
<b>I-81 OVER RTE. 311 BRIDGE</b>		<b>0</b>																						
<b>AREA 2</b>		<b>69</b>	<b>11-01-24</b>	<b>04-04-25</b>																				
5755	Install Temporary Concrete Barrier (I-81 SB) (Area 2) (Phase 3)	5	11-01-24	11-11-24																				
5765	Grading/Excavation (I-81 SB) (Area 2) (Phase 3)	9	11-08-24	11-26-24																				
5775	Install Storm Drainage (I-81 SB) (Area 2) (Phase 3)	50	11-14-24	03-10-25																				
5805	Install Aggregate Base Course (I-81 SB) (Area 2) (Phase 3)	25	01-23-25	03-21-25																				
5815	Install Asphalt Base Course (I-81 SB) (Area 2) (Phase 3)	20	02-10-25	03-25-25																				
5825	Install Asphalt Intermediate Course (I-81 SB) (Area 2) (Phase 3)	6	03-27-25	04-04-25																				
5835	Install Guardrail (I-81 SB) (Area 2) (Phase 3)	5	03-28-25	04-04-25																				
<b>I-81 OVER RTE. 619 BRIDGE</b>		<b>0</b>																						
<b>I-81 OVER RTE. 635 BRIDGE</b>		<b>0</b>																						
<b>AREA 1</b>		<b>0</b>																						
<b>PHASE 4</b>		<b>132</b>	<b>04-07-25</b>	<b>11-14-25</b>																				
<b>I-81 NB</b>		<b>81</b>	<b>04-07-25</b>	<b>08-26-25</b>																				
<b>AREA 1</b>		<b>14</b>	<b>04-07-25</b>	<b>05-01-25</b>																				
5180	Remove Temporary Concrete Barrier (I-81 NB) (Area 1) (Phase 4)	7	04-07-25	04-18-25																				
5190	Install Asphalt Surface Course (I-81 NB) (Area 1) (Phase 4)	7	04-15-25	04-25-25																				
5200	Install Permanent Pavement Markings/Signage (I-81 NB) (Area 1) (Phase 4)	6	04-22-25	05-01-25																				
<b>AREA 2</b>		<b>24</b>	<b>05-02-25</b>	<b>06-17-25</b>																				
5210	Remove Temporary Concrete Barrier (I-81 NB) (Area 2) (Phase 4)	13	05-02-25	05-29-25																				
5220	Install Asphalt Surface Course (I-81 NB) (Area 2) (Phase 4)	13	05-19-25	06-10-25																				
5230	Install Permanent Pavement Markings/Signage (I-81 NB) (Area 2) (Phase 4)	10	06-02-25	06-17-25																				
<b>AREA 3</b>		<b>22</b>	<b>06-19-25</b>	<b>07-24-25</b>																				
5240	Remove Temporary Concrete Barrier (I-81 NB) (Area 3) (Phase 4)	12	06-19-25	07-08-25																				
5250	Install Asphalt Surface Course (I-81 NB) (Area 3) (Phase 4)	12	06-30-25	07-18-25																				

█ Actual Level of Effort   
 █ Remaining Work   
 █ Critical Remaining Work   
 ◆ Milestone   
 ▼ summary





# APPENDICES

# APPENDIX 4.0.1.1

Technical Proposal Checklist and Contents

**ATTACHMENT 4.0.1.1**  
**I-81 WIDENING MM 136.6 TO MM 141.8**  
**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

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

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
<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 3.7 (Form C-78-RFP)	Sections 3.7, 4.0.1.1	no	Appendix 3.7
<b>List of Approved ATC's (if applicable)</b>	Attachment 3.6.7 (Form C-78-RFP)	Sections 3.6.7	no	N/A
<b>Letter of Submittal</b>	NA	Sections 4.1		1
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	1
Identify the full legal name and address of Offeror	NA	Section 4.1.1	yes	1
Authorized representative's original signature	NA	Section 4.1.1	yes	1
Declaration of intent	NA	Section 4.1.2	yes	1
120 day declaration	NA	Section 4.1.3	yes	1
Point of Contact information	NA	Section 4.1.4	yes	1
Principal Officer information	NA	Section 4.1.5	yes	1
<del>Interim Milestone and</del> Final Completion Date(s)	NA	Section 4.1.6	yes	1
<u>Unique Milestone Date</u>	<u>NA</u>	<u>Section 4.1.7</u>	<u>yes</u>	1
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	<u>Section 4.1.8</u> *	no	Appendix 9.3.1

\* Per VDOT's advice, information in the Technical Proposal Checklist has been changed to match RFP requirements.

**ATTACHMENT 4.0.1.1**  
**I-81 WIDENING MM 136.6 TO MM 141.8**  
**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	<u>Section 4.1.9 *</u>	no	Appendix 11.8.6
<u>Written Statement of DBE Participation (9%)</u>	<u>NA</u>	<u>Section 4.1.10</u>	<u>yes</u>	1
<b>Offeror's Qualifications</b>	NA	Section 4.2		2-3
Confirmation that the information provided in the SOQ submittal remains true and accurate or indicates that any requested changes were previously approved by VDOT	NA	Section 4.2.1	yes	2
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	3
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	2
<b>Design Concept</b>	NA	Section 4.3		4-21, Vol I Tab 1, Vol II
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	4-15, Vol I Tab 1-A, Vol II
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	15-21, Vol I Tab 1-B, Vol II
<b>Project Approach</b>	NA	Section 4.4		22-40
Environmental Management	NA	Section 4.4.1	yes	23-28
Utilities	NA	Section 4.4.2	yes	28-30
Geotechnical	NA	Section 4.4.3	yes	31-35

*\* Per VDOT's advice, information in the Technical Proposal Checklist has been changed to match RFP requirements.*

**ATTACHMENT 4.0.1.1**  
**I-81 WIDENING MM 136.6 TO MM 141.8**  
**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	35-40
<b>Construction of Project</b>	NA	Section 4.5		41-53
Sequence of Construction	NA	Section 4.5.1	yes	41-46
Transportation Management Plan	NA	Section 4.5.2	yes	46-53
<del>Disadvantaged Business Enterprises (DBE)</del>	<del>NA</del>	<del>Section 4.6</del>		
<del>—Written statement of percent DBE participation</del>	<del>NA</del>	<del>Section 4.6</del>	<del>yes</del>	
<b>Proposal Schedule</b>	NA	Section 4. <del>6</del> 7		PS-1-PS-13, Vol I Tab 3, Vol II
Proposal Schedule	NA	Section 4. <del>6</del> 7	no	PS-1, Vol I Tab 3, Vol II
Proposal Schedule Narrative	NA	Section 4. <del>6</del> 7	no	PS-1-PS-10, Vol I
Proposal Schedule in single .pdf	NA	Section 4. <del>6</del> 7	no	Provided in Tab 3, Vol II

## **APPENDIX 3.7**

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

**ATTACHMENT 3.7****COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION**RFP NO. C00116203DB108PROJECT NO.: 0081-080-946**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 3.7, the Offeror acknowledges receipt of the RFP and/or following revisions and/or addenda to the RFP for the above designated project which were issued under cover letter(s) of the date(s) shown hereon:

1. Cover letter of RFP – October 28, 2020  
(Date)
2. Cover letter of Addendum #1- December 16, 2020  
(Date)
3. Cover letter of Addendum #2- January 7, 2021  
(Date)
4. Cover letter of Addendum #3- January 27, 2021  
(Date)
5. Cover letter of Addendum #4- February 12, 2021  
(Date)



SIGNATURE

March 3, 2021

DATE

Jason Hoyle

PRINTED NAME

Vice President  
Branch Civil, Inc.

TITLE



# 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 3<sup>rd</sup> day of March, 2021, by and between the Virginia Department of Transportation (“VDOT”), and The Branch-Orders Joint Venture (“Offeror”).

**WITNESSETH:**

**WHEREAS**, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s May 29, 2020 Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the **I-81 Widening MM 136.6 to MM 141.8, Project No. 0081-080-946** (“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 **Two-hundred twenty five thousand and 00/100 Dollars (\$225,000.00)** ("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.

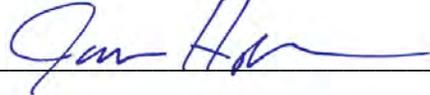
VIRGINIA DEPARTMENT OF TRANSPORTATION

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

Name: \_\_\_\_\_

Title: \_\_\_\_\_

*The Branch-Orders Joint Venture*

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

Name: Jason Hoyle

Title: Vice President – Branch Civil, Inc.



# **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.: 0081-080-946**

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

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

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

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

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

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

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



Signature

March 3, 2021

Date

Vice President - Design-Build/Major Projects

Title

Branch Civil, Inc.

Name of Firm

ATTACHMENT 11.8.6(a)  
CERTIFICATION REGARDING DEBARMENT  
PRIMARY COVERED TRANSACTIONS

Project No.: 0081-080-946

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.

      1/11/21      President  
Signature                                      Date                                      Title

Ordors Construction Company, Inc.  
Name of Firm

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

**Project No.: 0081-080-946**

- 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

1/20/2021

Date

Vice-President

Title

Whitman, Requardt, and Associates, LLP

Name of Firm

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

**Project No.: 0081-080-946**

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\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Partner

\_\_\_\_\_  
Title

Rummel, Klepper & Kahl, LLP

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

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

**Project No.: 0081-080-946**

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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.

	1/7/21	Vice President
Signature	Date	Title

Schnabel Engineering, LLC

---

Name of Firm

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

Project No.: 0081-080-946

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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.

	1/7/21	PRESIDENT
Signature	Date	Title

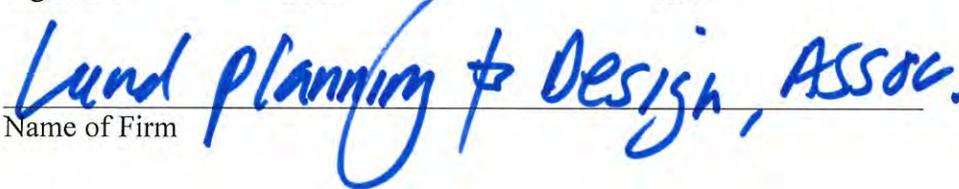
KDR REAL ESTATE SERVICES  
Name of Firm

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

Project No.: 0081-080-946

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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
		
Name of Firm		

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

**Project No.: 0081-080-946**

- 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>2/12/2021</u>	<u>President</u>
Signature	Date	Title

Precision Measurements, Inc.  
Name of Firm

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

**Project No.: 0081-080-946**

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.

 01/07/2020  
Signature Date

VP, BUSINESS ADMINISTRATION  
Title

SA STEVENSON CONSULTING, INC  
Name of Firm



# **VDOT APPROVED CHANGES**

Evidence of VDOT Approval for Team



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF TRANSPORTATION

Stephen C. Brich, P.E.  
Commissioner

1401 East Broad Street  
Richmond, Virginia 23219

(804) 786-2701  
Fax: (804) 786-2940

February 16, 2021

Mr. Donald Bryson  
Branch-ORDERS Joint Venture  
442 Rutherford Ave, NE  
Roanoke, VA 24016

**Subject: Request for Team Change**  
**I-81 Widening MM 136.6 to MM 141.8**  
**Roanoke County and City of Salem, Virginia**  
**Project No.: 0081-080-946**  
**Contract ID No.: C00116203DB108**

Dear Mr. Bryson,

Thank you for your request for a change to the Branch-ORDERS Joint Venture (Branch-ORDERS JV) team for the above referenced project. As you noted in your request and per a VDOT letter of December 3, 2020, H&B Surveying and Mapping LLC was released from the Branch-ORDERS JV as a condition of not precluding the Branch-ORDERS JV team from participating in the pursuit of the design-build contract for this project. The Branch-ORDERS JV proposed Precision Measurements, Inc. (PMI) as a replacement firm for their Surveying/Subsurface Utility Engineering services.

The Branch-ORDERS JV team also proposed the addition of Land Planning and Design Associates, Inc. for their landscaping services.

The information required for firms as part of the Statement of Qualifications was provided for the above referenced firms.

After careful consideration of the information provided by Branch-ORDERS Joint Venture and in accordance with Part 1 Section 11.4 of the RFP which allows VDOT to approve a change in the Team Structure under extraordinary circumstances, VDOT has determined it will grant the substitution of Precision Measurements, Inc. for H&B Surveying and Mapping LLC and the addition of Land Planning and Design Associates, Inc. to your team.

Sincerely,

Bryan W. Stevenson, P.E., DBIA  
Senior Project Delivery Engineer  
Alternative Project Delivery Division



*in association with Lead Designer*



*Joint Venture*

📍 442 Rutherford Avenue, NE, Roanoke, VA 24016 ☎ 540.982.1678

🌐 [www.branchcivil.com](http://www.branchcivil.com) | [www.ordersconstruction.com](http://www.ordersconstruction.com)

TECHNICAL PROPOSAL - VOLUME II

# I-81 WIDENING MM 136.6 TO MM 141.8

ROANOKE COUNTY AND CITY OF SALEM, VIRGINIA

State Project No.: 0081-080-946, P101, R201, C501, B677, B678,  
B681, B682, B683, B684, B685, B686, B687, B688

Federal Project No.: NHPP-0812 (323)

Contract ID Number: C00116203DB108



MARCH 3, 2021



Joint Venture

in association with Lead Designer





**TAB 1**  
Conceptual Design

## A. ROADWAY DESIGN

FHWA 534 DATA 31103

THIS PROJECT WAS DEVELOPED UTILIZING THE DEPARTMENT'S ENGINEERING DESIGN PACKAGE (GEOPAK/OPENROADS).  
GEOPAK Computer Identification No. 116203



COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION

TECHNICAL PROPOSAL  
CONCEPTUAL DESIGN  
For Information Only  
DATE: 03/03/21

THESE PLANS ARE UNFINISHED  
AND UNAPPROVED AND ARE NOT  
TO BE USED FOR ANY TYPE  
OF CONSTRUCTION OR THE  
ACQUISITION OF RIGHT OF WAY.

ADDITIONAL EASEMENTS FOR UTILITY  
RELOCATIONS MAY BE REQUIRED  
BEYOND THE PROPOSED RIGHT-OF-  
WAY SHOWN ON THESE PLANS.

PLAN AND PROFILE OF PROPOSED  
STATE HIGHWAY

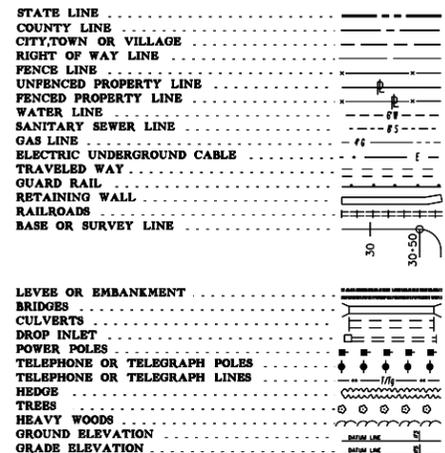
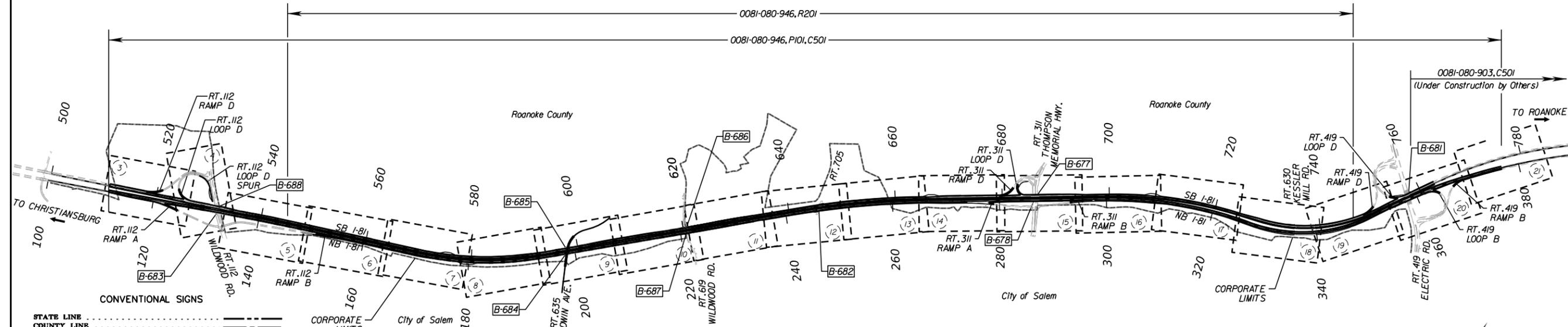
I-81 WIDENING MM 136.6 TO 141.8 DB PROJECT  
TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
ROANOKE COUNTY / CITY OF SALEM

STATE	FEDERAL AID	STATE		SHEET NO.
	PROJECT	ROUTE	PROJECT	
VA.	SEE TABULATION BELOW FOR SECTION NUMBERS	81	SEE MAP BELOW FOR PROJECT NUMBERS AND LOCATIONS	1

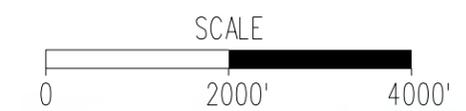
FUNCTIONAL CLASSIFICATION AND TRAFFIC DATA	
	INTERSTATE 81
From:	0.237 MI. NORTH INT. RT. 641
To:	0.349 MI. NORTH RT. 419
FUNCTIONAL CLASSIFICATION	INTERSTATE-URBAN
MIN. DESIGN SPEED	65 MPH
ADT (2019)	67,023
ADT (2043)	86,326
DHV	7,856
D (%) (design hour)	53%
T (%) (design hour)	19.2%
TC STD.	TC-5.1R
GEOMETRIC STD.	GS-INT

DESIGN EXCEPTIONS			
STA. TO STA.	DESIGN SPEED (MPH)	EXCEPTION FOR:	APPROVAL DATE
NB I-81 139+00 TO 151+00 349+50 TO 360+50 355+50 TO 359+50	65 MPH	SHOULDER WIDTH	SEPTEMBER 25, 2020
SB I-81 538+00 TO 550+00 748+50 TO 760+00 756+50 TO 760+00			

PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
SURVEYED BY, DATE  
DESIGN BY Whitman, Reardon & Associates 804-272-8700  
SUBSURFACE UTILITY BY, DATE



ROANOKE COUNTY POPULATION 92,376 (2010 CENSUS) / CITY OF SALEM POPULATION 24,802 (2010 CENSUS)

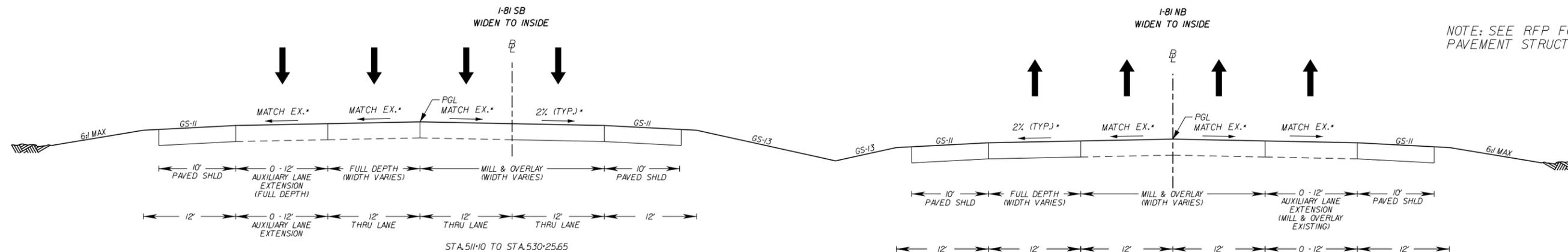


Copyright 2020, Commonwealth of Virginia

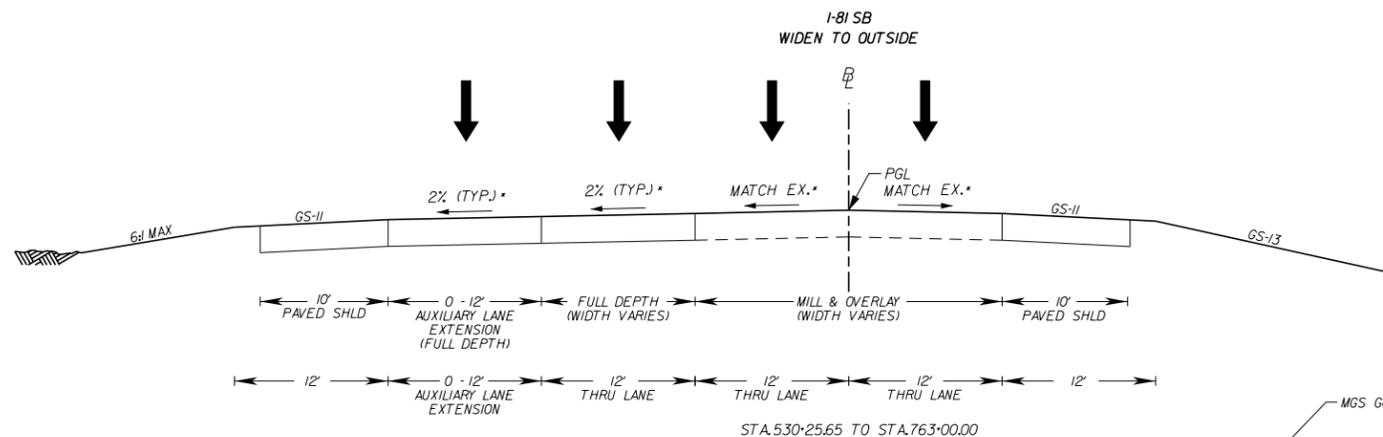
PROJECT	0081-080-946
SHEET NO.	1

# TYPICAL SECTIONS

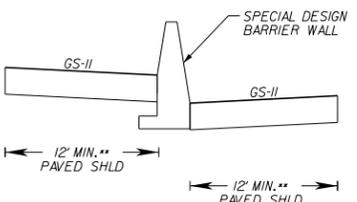
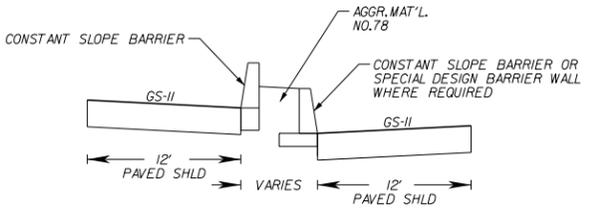
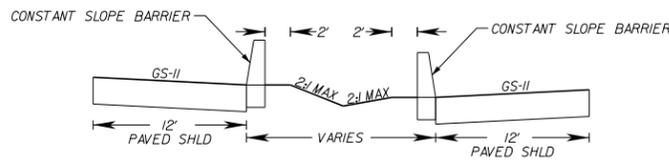
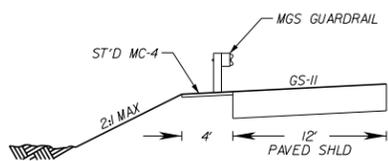
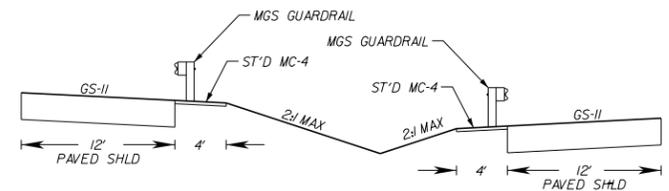
NOTE: SEE RFP FOR PROPOSED PAVEMENT STRUCTURE



STA.511+10 TO STA.530+25.65



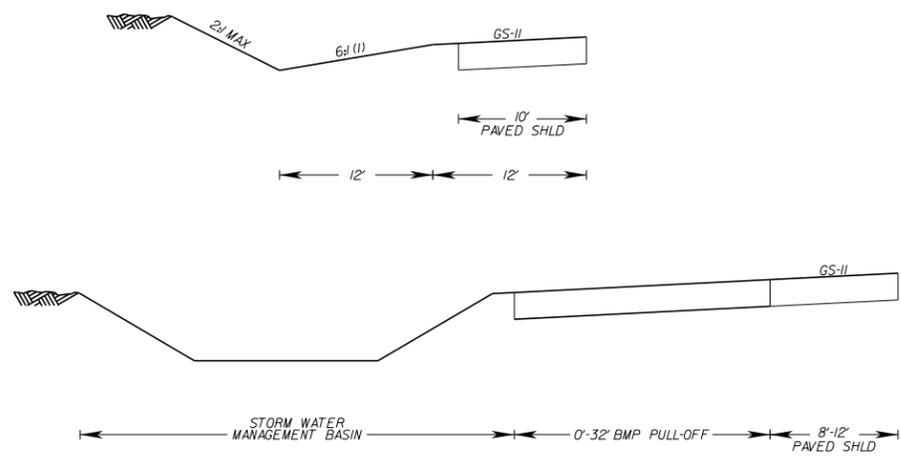
STA.530+25.65 TO STA.763+00.00



- \* THE CONTRACTOR SHALL UTILIZE THE EXISTING TRAVEL LANE CROSS SLOPE AND SUPERELEVATION WITH THE EXCEPTION OF THE FOLLOWING CONDITIONS WHERE VDOT STANDARDS SHALL BE REQUIRED:
  - EXISTING CROSS SLOPES THAT ARE LESS THAN 1% IN LOCATIONS REQUIRING NORMAL CROWN (2%)
  - EXISTING OR PROPOSED CROSS SLOPES RESULTING IN A BREAKOVER BETWEEN TRAVEL LANES OF GREATER THAN 6%
  - AVERAGE EXISTING SUPERELEVATION WITHIN HORIZONTAL CURVE (MEASURED IN 50' INCREMENTS ALONG THE CURVE, EXCLUDING STANDARD SUPERELEVATION TRANSITION AREAS) IS BELOW THE VDOT STANDARD BY MORE THAN 1%
  - ALL NEW FULL WIDTH PAVEMENT LOCATIONS
  - VERTICAL ALIGNMENT INCREASES OF MORE THAN 3"
    - MEASURED BETWEEN THE PROPOSED PGL AND EXISTING CROWN POINT WHEN COINCIDENT
    - MEASURED BETWEEN THE PROPOSED PAVEMENT ELEVATION AT THE EXISTING CROWN POINT WHEN THE HORIZONTAL ALIGNMENT IS SHIFTED BY LESS THAN 12'
  - HORIZONTAL ALIGNMENT SHIFTS OF MORE THAN 12' FROM EXISTING
- \*\* EXCEPT WHERE DESIGN WAIVER OR EXCEPTION HAS BEEN DETAILED IN RFP

(1) OUTSIDE DITCH FRONT SLOPE / WIDTH VARIATION LOCATIONS				
DIRECTION	BEGIN STATION	END STATION	MAX. DITCH FRONT SLOPE	MIN DITCH FRONT SLOPE WIDTH (FT)
NB	306+00	311+00	4:1	8
(2) NB	346+50	354+00	4:1	8
NB	359+00		5:1	11
NB	374+00	376+50	4:1	8
SB	511+00	513+50	5:1	10
SB	546+00	548+50	5:1	10
SB	730+00	732+50	4:1	8

(2) MAINTAIN EXISTING OUTSIDE PAVED SHOULDER WIDTH AT THIS LOCATION. IF ABLE TO TIE TO THE EXISTING DITCH FRONT SLOPE WITH A 4:1 MAX. FRONT SLOPE, MINIMUM DITCH FRONT SLOPE WIDTH DOES NOT APPLY GIVEN ADEQUATE HYDRAULIC CAPACITY IS PROVIDED. IF ADEQUATE HYDRAULIC CAPACITY IS NOT AVAILABLE, PROVIDE USING THE DITCH FRONT SLOPE AND WIDTH VALUES IN TABLE.



NOT TO SCALE

## TECHNICAL PROPOSAL CONCEPTUAL DESIGN

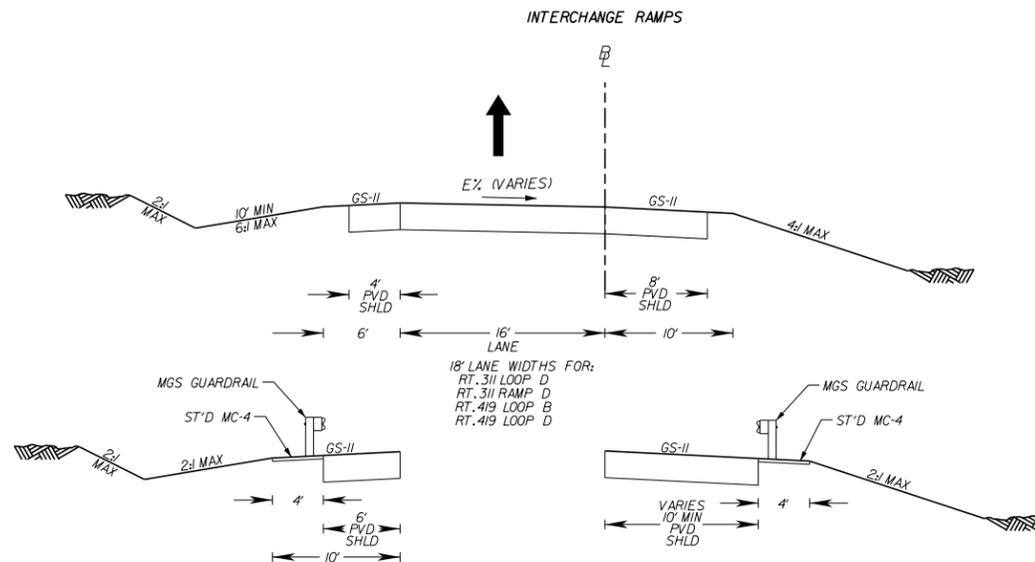
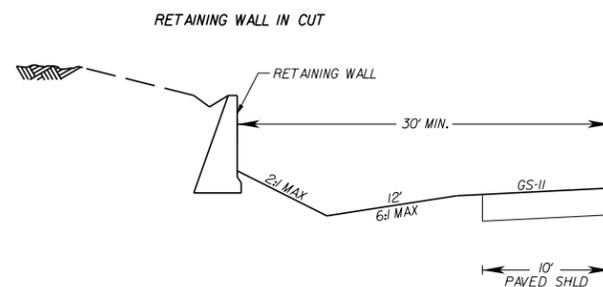
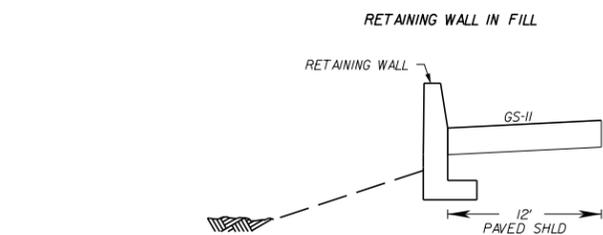
I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 2A OF 21



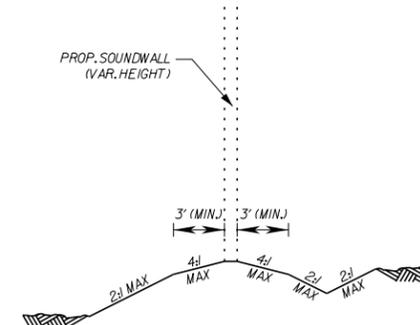
PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Requardt & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

# TYPICAL SECTIONS

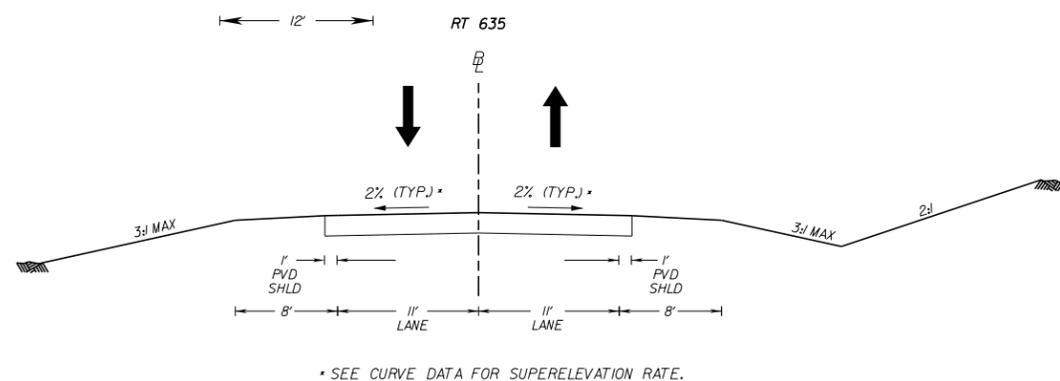
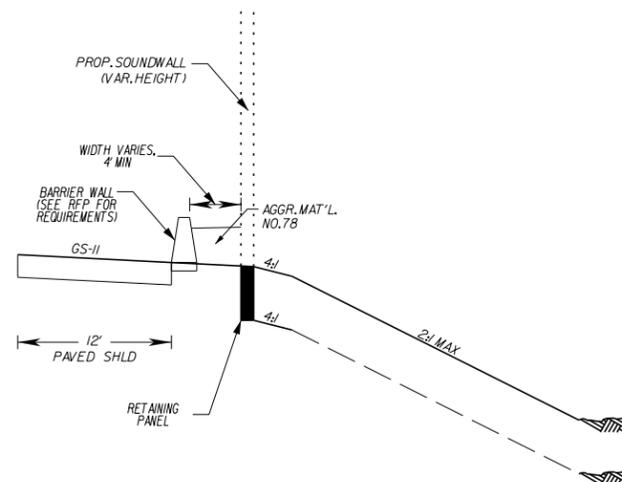
NOTE: SEE RFP FOR PROPOSED PAVEMENT STRUCTURE



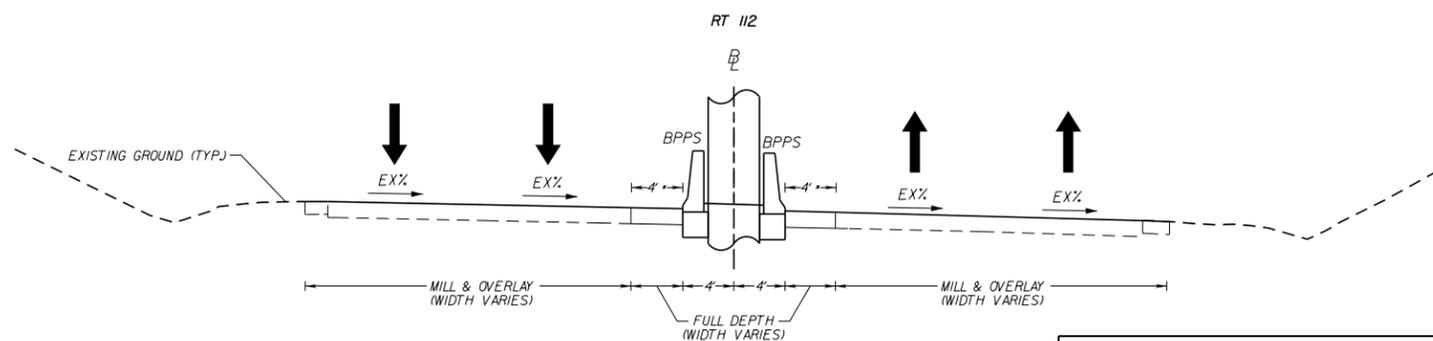
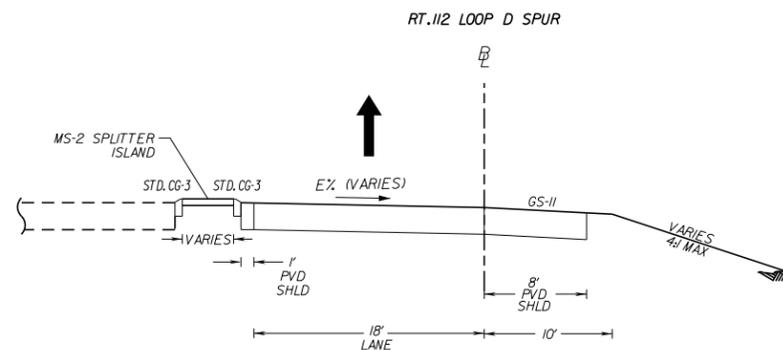
PROPOSED SOUNDWALL NOT ADJACENT TO SHOULDER



PROPOSED SOUNDWALL ADJACENT TO SHOULDER



\* SEE CURVE DATA FOR SUPERELEVATION RATE.



\* 4' MIN. FLUSH PAVED OFFSET BETWEEN INSIDE EDGE OF TRAVELWAY AND BPPS.

LOCATION	BRANCH-ORDERS MAXIMUM GRADE	ALLOWABLE MAXIMUM GRADE
I-81	3.50%	4%
Route 112 Ramp A	4.70%	3-5%
Route 112 Ramp B	3.60%	3-5%
Route 112 Ramp D	4.00%	4-6%
Route 112 Loop D	1.50%	5-7%
Route 112 Loop D Spur	3.00%	6-8%
Route 112 (Wildwood Rd.)	N/A	N/A
Route 311 Ramp A	3.60%	3-5%
Route 311 Ramp B	1.30%	3-5%
Route 311 Ramp D	2.90%	4-6%
Route 311 Loop D	3.70%	5-7%
Route 419 Ramp B	2.30%	4-6%
Route 419 Ramp D	3.70%	4-6%
Route 419 Loop B	2.80%	5-7%
Route 419 Loop D	3.20%	5-7%
Route 635 (Goodwin Ave.)	7.00%	10%
Route 619 (Wildwood Rd.)	N/A	N/A

TECHNICAL PROPOSAL CONCEPTUAL DESIGN

I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 2B OF 21



NOT TO SCALE

PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**RTE 112 RAMP A CURVE DATA**

PI = 1000+92.31  
 DELTA = 10°32'54.31" (RT)  
 D = 05°43'46"  
 T = 92.31'  
 L = 184.10'  
 R = 1,000.00'  
 PC = 1000+00.00  
 PT = 1001+84.10  
 e = 6.8%  
 V = 45 MPH

**RTE 112 RAMP D CURVE DATA**

PI = 1003+06.75  
 DELTA = 03°57'26.48" (RT)  
 D = 01°36'50"  
 T = 122.65'  
 L = 245.19'  
 R = 3,550.00'  
 PC = 1001+84.10  
 PT = 1004+29.30  
 e = 2.8%  
 V = 45 MPH

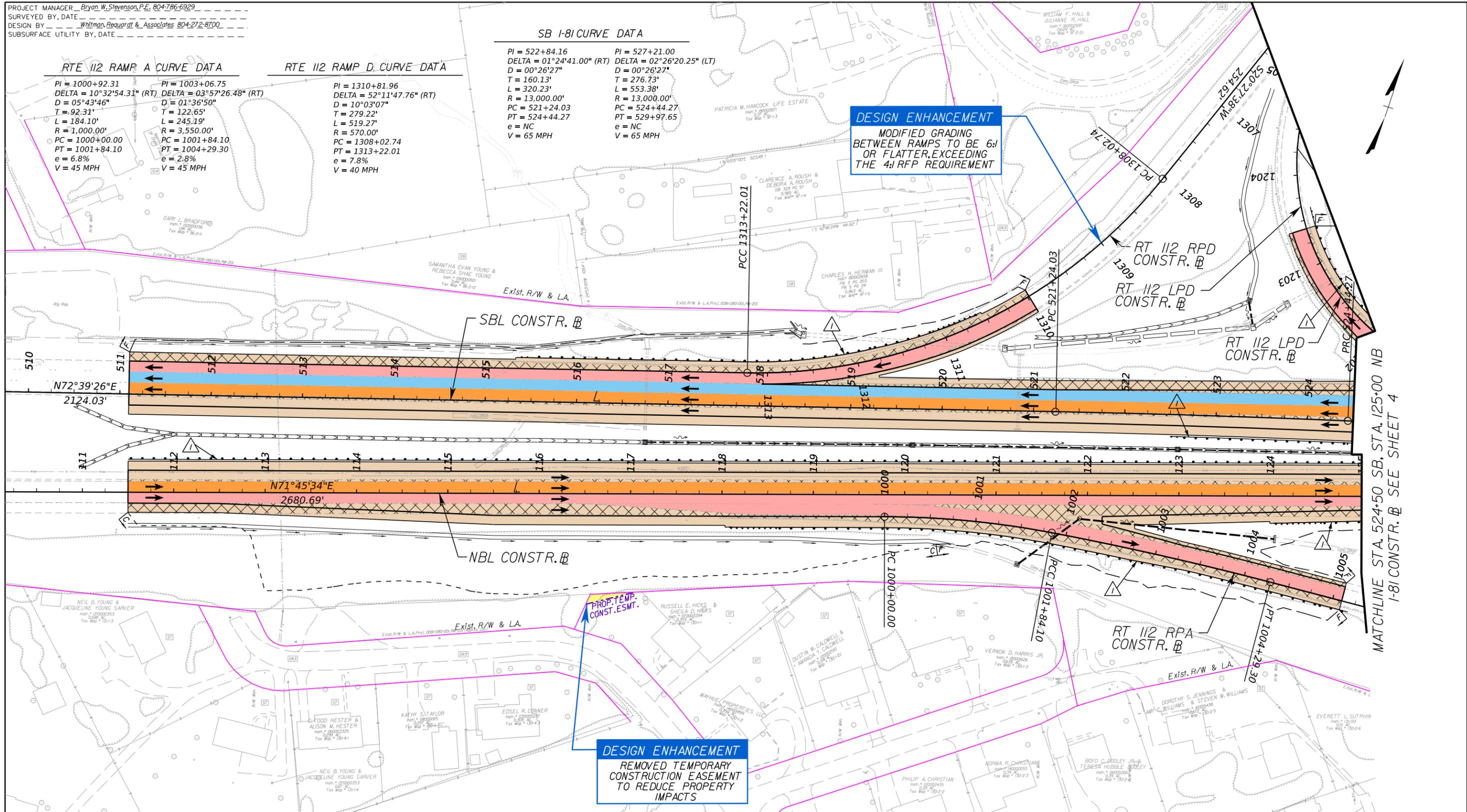
**SB I-81 CURVE DATA**

PI = 522+84.16  
 DELTA = 01°24'41.00" (RT)  
 D = 00°26'27"  
 T = 160.13'  
 L = 320.23'  
 R = 13,000.00'  
 PC = 521+24.03  
 PT = 524+44.27  
 e = NC  
 V = 65 MPH

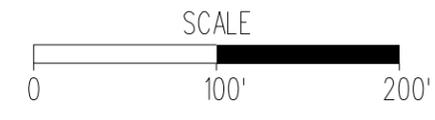
PI = 527+21.00  
 DELTA = 02°26'20.25" (LT)  
 D = 00°26'27"  
 T = 276.73'  
 L = 553.38'  
 R = 13,000.00'  
 PC = 524+44.27  
 PT = 529+97.65  
 e = NC  
 V = 65 MPH

**DESIGN ENHANCEMENT**  
 MODIFIED GRADING  
 BETWEEN RAMPS TO BE 6:1  
 OR FLATTER, EXCEEDING  
 THE 4:1 RFP REQUIREMENT

**DESIGN ENHANCEMENT**  
 REMOVED TEMPORARY  
 CONSTRUCTION EASEMENT  
 TO REDUCE PROPERTY  
 IMPACTS



LEGEND:	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
	EXISTING EASEMENT
	PROPOSED LIMITED ACCESS LINE
	PROPOSED RIGHT OF WAY
	PROPOSED TEMPORARY EASEMENT
	PROPOSED PERMANENT EASEMENT
	PROPOSED UTILITY EASEMENT
	RFP PROPOSED LIMITED ACCESS LINE
	RFP PROPOSED TEMPORARY EASEMENT
	RFP PROPOSED PERMANENT EASEMENT
	RFP PROPOSED RIGHT OF WAY
	2 INCH MIN. MILL AND OVERLAY
	4 INCH MIN. MILL AND OVERLAY
	6 INCH MIN. MILL AND OVERLAY
	FULL DEPTH PAVEMENT
	PAVEMENT DEMOLITION
	AREAS OF REDUCED ROW / EASEMENT IMPACTS
	POTENTIAL NOISE BARRIER
	PROPOSED FENCE
	PROPOSED GUARDRAIL REQ'D
	PROPOSED CONCRETE BARRIER REQ'D
	PROPOSED PIER PROTECTION BARRIER REQ'D
	PROPOSED RETAINING WALL REQ'D
	PROPOSED CURBING REQ'D
	DENOTES CONSTRUCTION LIMITS IN CUT
	DENOTES CONSTRUCTION LIMITS IN FILL
	16" W PROPOSED WATER RELOCATION
	4" FM PROPOSED SEWER RELOCATION



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 3 OF 21





**RTE I12 CURVE DATA**

PI = 1409+40.39 DELTA = 18°37'27.30" (RT) D = 00°59'57" T = 940.39' L = 1,864.19' R = 5,735.00' PC = 1400+00.00 PT = 1418+64.19 e = Match Exist. V = 35 MPH	PI = 1420+05.00 DELTA = 04°47'32.17" (LT) D = 01°42'10" T = 140.81' L = 281.45' R = 3,365.00' PC = 1418+64.19 PT = 1421+45.64 e = Match Exist. V = 35 MPH
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**NB I-81 CURVE DATA**

PI = 128+31.32 DELTA = 01°19'39.57" (LT) D = 00°26'27" T = 150.62' L = 301.24' R = 13,000.00' PC = 126+80.69 PT = 129+81.93 e = NC V = 65 MPH	PI = 131+87.22 DELTA = 02°24'00.51" (RT) D = 00°35'05" T = 205.29' L = 410.53' R = 9,800.00' PC = 129+81.93 PT = 133+92.45 e = 2.0% V = 65 MPH	PI = 135+07.16 DELTA = 01°00'40.04" (LT) D = 00°26'27" T = 114.71' L = 229.42' R = 13,000.00' PC = 133+92.45 PT = 136+21.87 e = NC V = 65 MPH
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**SB I-81 CURVE DATA**

PI = 527+21.00 DELTA = 02°26'20.25" (LT) D = 00°26'27" T = 276.73' L = 553.38' R = 13,000.00' PC = 524+44.27 PT = 529+97.65 e = NC V = 65 MPH	PI = 531+26.23 DELTA = 01°29'37.18" (RT) D = 00°34'51" T = 128.58' L = 257.15' R = 9,864.00' PC = 529+97.65 PT = 532+54.80 e = 2.0% V = 65 MPH	PI = 535+02.61 DELTA = 02°11'02.88" (LT) D = 00°26'27" T = 247.81' L = 495.56' R = 13,000.00' PC = 532+54.80 PT = 537+50.36 e = NC V = 65 MPH
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**RTE I12 LOOP D CURVE DATA**

PI = 1200+81.18 DELTA = 28°28'16.43" (RT) D = 17°54'18" T = 81.18' L = 159.01' R = 320.00' PC = 1200+00.00 PT = 1201+59.01 e = 7.4% V = 30 MPH	PI = 1212+58.92 DELTA = 155°09'29.79" (RT) D = 23°39'05" T = 1,099.91' L = 656.02' R = 242.25' PC = 1201+59.01 PT = 1208+15.03 e = 8.0% V = 30 MPH
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**RTE I12 LOOP D SPUR CURVE DATA**

PI = 1500+27.55 DELTA = 09°00'04.42" (RT) D = 16°22'13" T = 27.55' L = 54.99' R = 350.00' PC = 1500+00.00 PT = 1500+54.99 e = 4.9% V = 20 MPH	PI = 1501+40.56 DELTA = 37°47'26.35" (RT) D = 22°55'06" T = 85.57' L = 164.89' R = 250.00' PC = 1500+54.99 PT = 1502+19.88 e = 5.6% V = 20 MPH
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**RTE I12 RAMP D CURVE DATA**

PI = 1502+75.83 DELTA = 16°58'25.85" (RT) D = 15°16'44" T = 55.96' L = 111.09' R = 375.00' PC = 1502+19.88 PT = 1503+30.97 e = 4.7% V = 20 MPH	PI = 1304+16.77 DELTA = 55°55'52.92" (LT) D = 19°25'20" T = 156.63' L = 287.98' R = 295.00' PC = 1302+60.15 PT = 1305+48.12 e = Match Exist. V = N/A
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**DESIGN ENHANCEMENT**  
 MODIFIED I-81 BASELINES OVER ROUTE I12 AND SUPERELEVATED THE BRIDGES TO MINIMIZE WIDENING TO THE WEST. REDUCE THE RFP VERTICAL CHANGE IN GRADE BY AS MUCH AS 2.75' AND ELIMINATE THE NEED FOR TEMPORARY ALIGNMENT AND ONE PHASE OF BRIDGE CONSTRUCTION

**DESIGN ENHANCEMENT**  
 DESIGNED BMP WITH ACCESS FROM SIDE ROAD RESULTING IN SAFER CONSTRUCTION AND LONG-TERM MAINTENANCE

**DESIGN ENHANCEMENT**  
 REFINED ROADWAY DESIGN AND REDUCED FILL SLOPE ENCROACHMENT TO SAVE 25 LF OF STREAM IMPACTS AND AVOID ALL IMPACTS TO THE FEMA FLOODPLAIN

**DESIGN ENHANCEMENT**  
 MODIFIED DEPARTURE CURVE RADIUS FROM 250' TO 320' TO INCREASE DRIVER SAFETY

**LEGEND:**

EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	2 INCH MIN. MILL AND OVERLAY	PROPOSED GUARDRAIL REQ'D	SFM	SFM
EXISTING EASEMENT	4 INCH MIN. MILL AND OVERLAY	PROPOSED CONCRETE BARRIER REQ'D	G	NATURAL GAS
PROPOSED LIMITED ACCESS LINE	6 INCH MIN. MILL AND OVERLAY	PROPOSED PIER PROTECTION BARRIER REQ'D	24W	EXISTING WATER
PROPOSED RIGHT OF WAY	FULL DEPTH PAVEMENT	PROPOSED RETAINING WALL REQ'D	E	EXISTING ELECTRIC
PROPOSED TEMPORARY EASEMENT	PAVEMENT DEMOLITION	PROPOSED CURBING REQ'D	FO	EXISTING FIBER OPTIC
PROPOSED PERMANENT EASEMENT	AREAS OF REDUCED ROW / EASEMENT IMPACTS		CAV	EXISTING CABLE TV
PROPOSED UTILITY EASEMENT	POTENTIAL NOISE BARRIER		T/TS	EXISTING TELEPHONE
RFP PROPOSED LIMITED ACCESS LINE	PROPOSED FENCE		TC	EXISTING TRAFFIC CONTROL
RFP PROPOSED TEMPORARY EASEMENT			UK	EXISTING UNKNOWN UTILITY
RFP PROPOSED PERMANENT EASEMENT				
RFP PROPOSED RIGHT OF WAY				

PROPOSED GUARDRAIL REQ'D	PROPOSED WATER RELOCATION
PROPOSED CONCRETE BARRIER REQ'D	PROPOSED SEWER RELOCATION
PROPOSED PIER PROTECTION BARRIER REQ'D	
PROPOSED RETAINING WALL REQ'D	
PROPOSED CURBING REQ'D	
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
PROPOSED RETAINING WALL REQ'D
PROPOSED CURBING REQ'D
DENOTES CONSTRUCTION LIMITS IN CUT
DENOTES CONSTRUCTION LIMITS IN FILL
PROPOSED WATER RELOCATION
PROPOSED SEWER RELOCATION

**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC I16203 (PROJECT # 0081-080-946)  
 SHEET 4 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

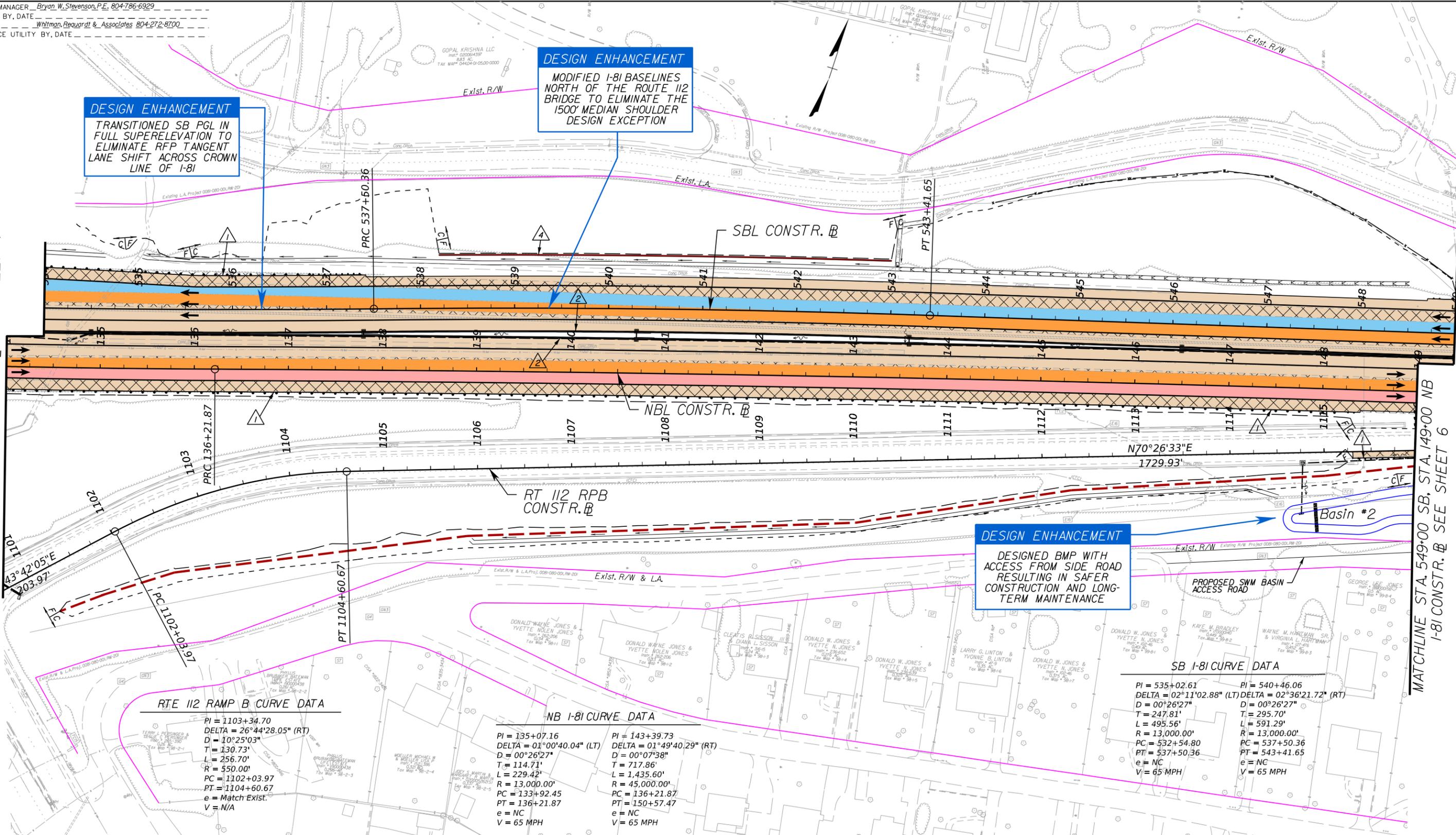
**DESIGN ENHANCEMENT**  
 TRANSITIONED SB PGL IN FULL SUPERELEVATION TO ELIMINATE RFP TANGENT LANE SHIFT ACROSS CROWN LINE OF I-81

**DESIGN ENHANCEMENT**  
 MODIFIED I-81 BASELINES NORTH OF THE ROUTE 112 BRIDGE TO ELIMINATE THE 1500' MEDIAN SHOULDER DESIGN EXCEPTION

**DESIGN ENHANCEMENT**  
 DESIGNED BMP WITH ACCESS FROM SIDE ROAD RESULTING IN SAFER CONSTRUCTION AND LONG-TERM MAINTENANCE

MATCHLINE STA. 534+00 SB, STA. 134+00 NB I-81 CONSTR. @ SEE SHEET 4

MATCHLINE STA. 549+00 SB, STA. 149+00 NB I-81 CONSTR. @ SEE SHEET 6



**RTE 112 RAMP B CURVE DATA**

PI = 1103+34.70
DELTA = 26°44'28.05" (RT)
D = 10°25'03"
T = 130.73'
L = 256.70'
R = 550.00'
PC = 1102+03.97
PT = 1104+60.67
e = Match Exist.
V = N/A

**NB I-81 CURVE DATA**

PI = 135+07.16	PI = 143+39.73
DELTA = 01°00'40.04" (LT)	DELTA = 01°49'40.29" (RT)
D = 00°26'27"	D = 00°07'38"
T = 114.71'	T = 717.86'
L = 229.42'	L = 1,435.60'
R = 13,000.00'	R = 45,000.00'
PC = 133+92.45	PC = 136+21.87
PT = 136+21.87	PT = 150+57.47
e = NC	e = NC
V = 65 MPH	V = 65 MPH

**SB I-81 CURVE DATA**

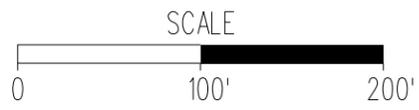
PI = 535+02.61	PI = 540+46.06
DELTA = 02°11'02.88" (LT)	DELTA = 02°36'21.72" (RT)
D = 00°26'27"	D = 00°26'27"
T = 247.81'	T = 295.70'
L = 495.56'	L = 591.29'
R = 13,000.00'	R = 13,000.00'
PC = 532+54.80	PC = 537+50.36
PT = 537+50.36	PT = 543+41.65
e = NC	e = NC
V = 65 MPH	V = 65 MPH

- LEGEND:**
- EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
  - - - EXISTING EASEMENT
  - - - PROPOSED LIMITED ACCESS LINE
  - - - PROPOSED RIGHT OF WAY
  - - - PROPOSED TEMPORARY EASEMENT
  - - - PROPOSED PERMANENT EASEMENT
  - - - PROPOSED UTILITY EASEMENT
  - - - RFP PROPOSED LIMITED ACCESS LINE
  - - - RFP PROPOSED TEMPORARY EASEMENT
  - - - RFP PROPOSED PERMANENT EASEMENT
  - - - RFP PROPOSED RIGHT OF WAY

- 2 INCH MIN. MILL AND OVERLAY
- 4 INCH MIN. MILL AND OVERLAY
- 6 INCH MIN. MILL AND OVERLAY
- FULL DEPTH PAVEMENT
- PAVEMENT DEMOLITION
- AREAS OF REDUCED ROW / EASEMENT IMPACTS
- POTENTIAL NOISE BARRIER
- PROPOSED FENCE

- PROPOSED GUARDRAIL REQ'D
- PROPOSED CONCRETE BARRIER REQ'D
- PROPOSED PIER PROTECTION BARRIER REQ'D
- PROPOSED RETAINING WALL REQ'D
- PROPOSED CURBING REQ'D
- [Symbol] — DENOTES CONSTRUCTION LIMITS IN CUT
- [Symbol] — DENOTES CONSTRUCTION LIMITS IN FILL
- [Symbol] — PROPOSED WATER RELOCATION
- [Symbol] — PROPOSED SEWER RELOCATION

- SFM — SFM
- G — NATURAL GAS
- 2" W — EXISTING WATER
- E — EXISTING ELECTRIC
- FO — EXISTING FIBER OPTIC
- CAV — EXISTING CABLE TV
- T/TS — EXISTING TELEPHONE
- TC — EXISTING TRAFFIC CONTROL
- UK — EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 5 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reed & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**RTE 112 RAMP B CURVE DATA**

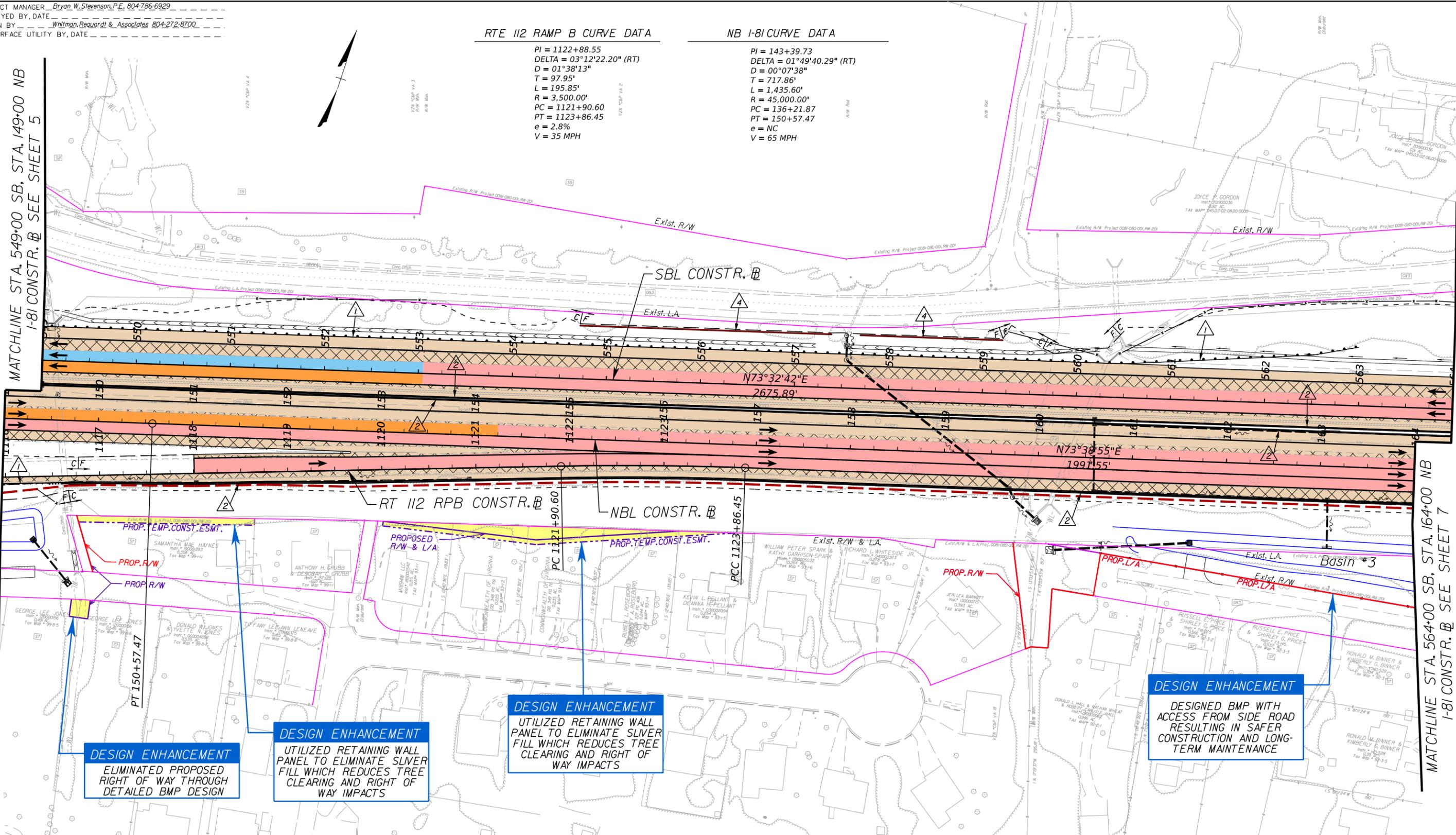
PI = 1122+88.55  
 DELTA = 03°12'22.20" (RT)  
 D = 01°38'13"  
 T = 97.95'  
 L = 195.85'  
 R = 3,500.00'  
 PC = 1121+90.60  
 PT = 1123+86.45  
 e = 2.8%  
 V = 35 MPH

**NB I-81 CURVE DATA**

PI = 143+39.73  
 DELTA = 01°49'40.29" (RT)  
 D = 00°07'38"  
 T = 717.86'  
 L = 1,435.60'  
 R = 45,000.00'  
 PC = 136+21.87  
 PT = 150+57.47  
 e = NC  
 V = 65 MPH

MATCHLINE STA. 549+00 SB, STA. 149+00 NB  
I-81 CONSTR. SEE SHEET 5

MATCHLINE STA. 564+00 SB, STA. 164+00 NB  
I-81 CONSTR. SEE SHEET 7



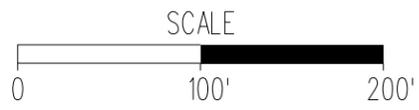
**DESIGN ENHANCEMENT**  
 ELIMINATED PROPOSED RIGHT OF WAY THROUGH DETAILED BMP DESIGN

**DESIGN ENHANCEMENT**  
 UTILIZED RETAINING WALL PANEL TO ELIMINATE SLIVER FILL WHICH REDUCES TREE CLEARING AND RIGHT OF WAY IMPACTS

**DESIGN ENHANCEMENT**  
 UTILIZED RETAINING WALL PANEL TO ELIMINATE SLIVER FILL WHICH REDUCES TREE CLEARING AND RIGHT OF WAY IMPACTS

**DESIGN ENHANCEMENT**  
 DESIGNED BMP WITH ACCESS FROM SIDE ROAD RESULTING IN SAFER CONSTRUCTION AND LONG-TERM MAINTENANCE

LEGEND:			
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED GUARDRAIL REQ'D
	EXISTING EASEMENT		PROPOSED CONCRETE BARRIER REQ'D
	PROPOSED LIMITED ACCESS LINE		PROPOSED PIER PROTECTION BARRIER REQ'D
	PROPOSED RIGHT OF WAY		PROPOSED RETAINING WALL REQ'D
	PROPOSED TEMPORARY EASEMENT		PROPOSED CURBING REQ'D
	PROPOSED PERMANENT EASEMENT		DENOTES CONSTRUCTION LIMITS IN CUT
	PROPOSED UTILITY EASEMENT		DENOTES CONSTRUCTION LIMITS IN FILL
	RFP PROPOSED LIMITED ACCESS LINE		PROPOSED WATER RELOCATION
	RFP PROPOSED TEMPORARY EASEMENT		PROPOSED SEWER RELOCATION
	RFP PROPOSED PERMANENT EASEMENT		SFW
	RFP PROPOSED RIGHT OF WAY		NATURAL GAS
	2 INCH MIN. MILL AND OVERLAY		EXISTING WATER
	4 INCH MIN. MILL AND OVERLAY		EXISTING ELECTRIC
	6 INCH MIN. MILL AND OVERLAY		EXISTING FIBER OPTIC
	FULL DEPTH PAVEMENT		EXISTING CABLE TV
	PAVEMENT DEMOLITION		EXISTING TELEPHONE
	AREAS OF REDUCED ROW / EASEMENT IMPACTS		EXISTING TRAFFIC CONTROL
	POTENTIAL NOISE BARRIER		EXISTING UNKNOWN UTILITY
	PROPOSED FENCE		



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 6 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**NB I-81 CURVE DATA**

PI = 182+19.20  
 DELTA = 22°15'09.95" (LT)  
 D = 00°57'47"  
 T = 1,170.19'  
 L = 2,310.88'  
 R = 5,950.00'  
 PC = 170+49.01  
 PT = 193+59.90  
 e = 3.2%  
 V = 65 MPH

**SB I-81 CURVE DATA**

PI = 577+47.41  
 DELTA = 14°31'05.42" (LT)  
 D = 01°00'00"  
 T = 729.87'  
 L = 1,451.92'  
 R = 5,730.00'  
 PC = 570+17.54  
 PT = 584+69.47  
 e = 3.2%  
 V = 65 MPH

MATCHLINE STA. 564+00 SB, STA. 164+00 NB  
I-81 CONSTR. @ SEE SHEET 6

MATCHLINE STA. 579+00 SB, STA. 179+00 NB  
I-81 CONSTR. @ SEE SHEET 8

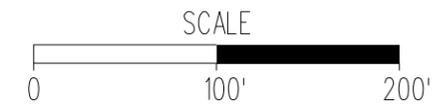
**DESIGN ENHANCEMENT**  
 MODIFIED SWM DESIGN TO  
 REDUCE GRADING AND  
 RIGHT OF WAY IMPACTS

**DESIGN ENHANCEMENT**  
 UTILIZED RETAINING WALL  
 PANEL TO ELIMINATE SLIVER  
 FILL WHICH REDUCES TREE  
 CLEARING AND RIGHT OF  
 WAY IMPACTS

**DESIGN ENHANCEMENT**  
 UTILIZED RETAINING WALL  
 PANEL TO ELIMINATE SLIVER  
 FILL WHICH REDUCES TREE  
 CLEARING AND RIGHT OF  
 WAY IMPACTS

**DESIGN ENHANCEMENT**  
 MODIFIED BASELINE TO  
 REDUCE GRADING IMPACTS  
 EAST OF THE ROADWAY  
 WHICH REDUCES TREE  
 CLEARING, CULVERT  
 EXTENSION, AND RIGHT OF  
 WAY IMPACTS

LEGEND:			
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED GUARDRAIL REQ'D
	EXISTING EASEMENT		PROPOSED CONCRETE BARRIER REQ'D
	PROPOSED LIMITED ACCESS LINE		PROPOSED PIER PROTECTION BARRIER REQ'D
	PROPOSED RIGHT OF WAY		PROPOSED RETAINING WALL REQ'D
	PROPOSED TEMPORARY EASEMENT		PROPOSED CURBING REQ'D
	PROPOSED PERMANENT EASEMENT		DENOTES CONSTRUCTION LIMITS IN CUT
	PROPOSED UTILITY EASEMENT		DENOTES CONSTRUCTION LIMITS IN FILL
	RFP PROPOSED LIMITED ACCESS LINE		PROPOSED WATER RELOCATION
	RFP PROPOSED TEMPORARY EASEMENT		PROPOSED SEWER RELOCATION
	RFP PROPOSED PERMANENT EASEMENT		SFM
	RFP PROPOSED RIGHT OF WAY		NATURAL GAS
	2 INCH MIN. MILL AND OVERLAY		EXISTING WATER
	4 INCH MIN. MILL AND OVERLAY		EXISTING ELECTRIC
	6 INCH MIN. MILL AND OVERLAY		EXISTING FIBER OPTIC
	FULL DEPTH PAVEMENT		EXISTING CABLE TV
	PAVEMENT DEMOLITION		EXISTING TELEPHONE
	AREAS OF REDUCED ROW / EASEMENT IMPACTS		EXISTING TRAFFIC CONTROL
	POTENTIAL NOISE BARRIER		EXISTING UNKNOWN UTILITY
	PROPOSED FENCE		



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 7 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**NB I-81 CURVE DATA**

PI = 182+19.20  
 DELTA = 22°15'09.95" (LT)  
 D = 00°57'47"  
 T = 1,170.19'  
 L = 2,310.88'  
 R = 5,950.00'  
 PC = 170+49.01  
 PT = 193+59.90  
 e = 3.2%  
 V = 65 MPH

**SB I-81 CURVE DATA**

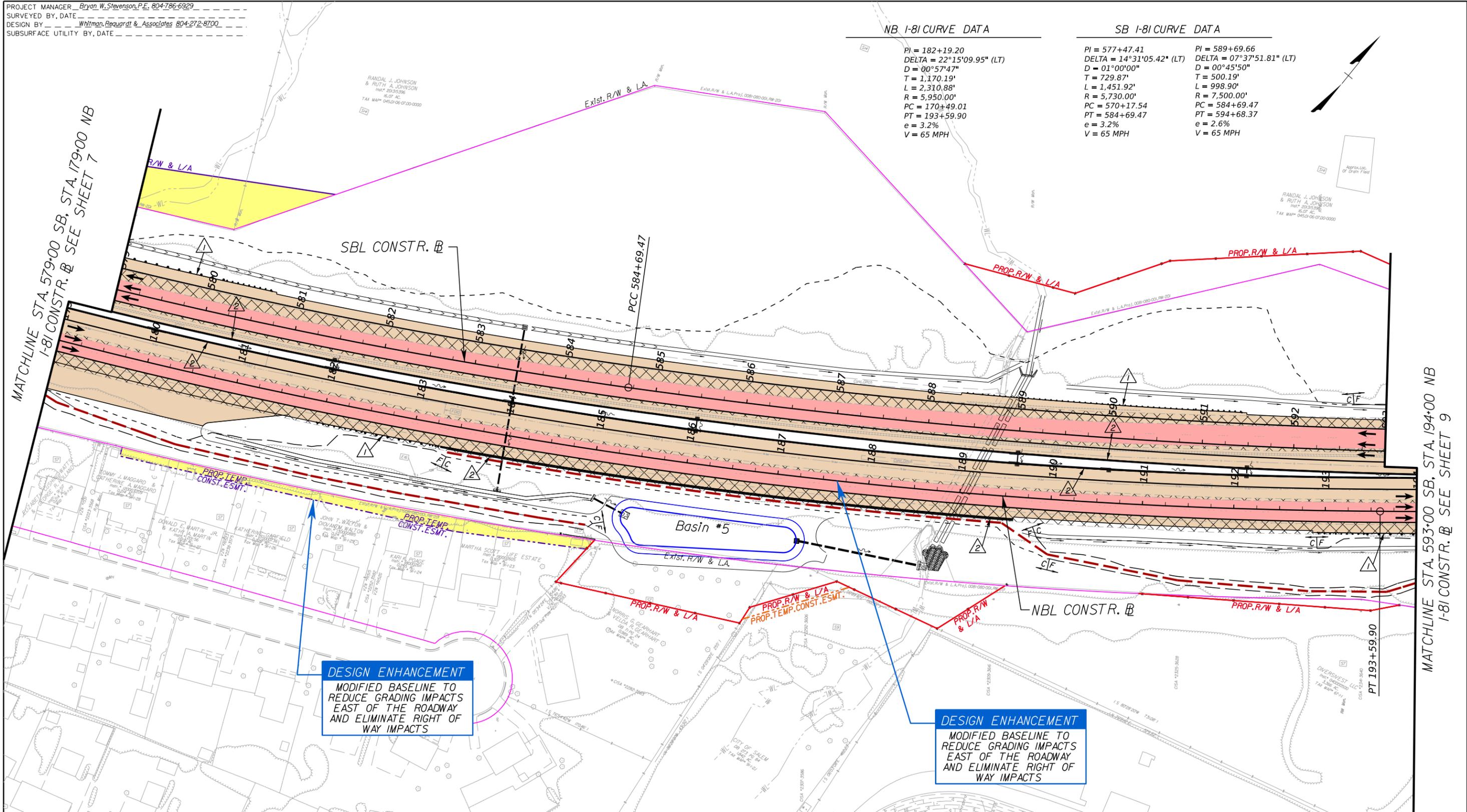
PI = 577+47.41  
 DELTA = 14°31'05.42" (LT)  
 D = 01°00'00"  
 T = 729.87'  
 L = 1,451.92'  
 R = 5,730.00'  
 PC = 570+17.54  
 PT = 584+69.47  
 e = 3.2%  
 V = 65 MPH

PI = 589+69.66  
 DELTA = 07°37'51.81" (LT)  
 D = 00°45'50"  
 T = 500.19'  
 L = 998.90'  
 R = 7,500.00'  
 PC = 584+69.47  
 PT = 594+68.37  
 e = 2.6%  
 V = 65 MPH



MATCHLINE STA. 579+00 SB, STA. 179+00 NB  
 I-81 CONSTR. SEE SHEET 7

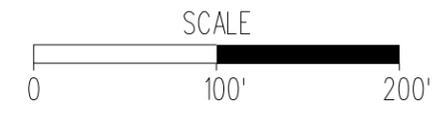
MATCHLINE STA. 593+00 SB, STA. 194+00 NB  
 I-81 CONSTR. SEE SHEET 9



**DESIGN ENHANCEMENT**  
 MODIFIED BASELINE TO  
 REDUCE GRADING IMPACTS  
 EAST OF THE ROADWAY  
 AND ELIMINATE RIGHT OF  
 WAY IMPACTS

**DESIGN ENHANCEMENT**  
 MODIFIED BASELINE TO  
 REDUCE GRADING IMPACTS  
 EAST OF THE ROADWAY  
 AND ELIMINATE RIGHT OF  
 WAY IMPACTS

LEGEND:			
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		PROPOSED GUARDRAIL REQ'D
	EXISTING EASEMENT		PROPOSED CONCRETE BARRIER REQ'D
	PROPOSED LIMITED ACCESS LINE		PROPOSED PIER PROTECTION BARRIER REQ'D
	PROPOSED RIGHT OF WAY		PROPOSED RETAINING WALL REQ'D
	PROPOSED TEMPORARY EASEMENT		PROPOSED CURBING REQ'D
	PROPOSED PERMANENT EASEMENT		— C — DENOTES CONSTRUCTION LIMITS IN CUT
	PROPOSED UTILITY EASEMENT		— F — DENOTES CONSTRUCTION LIMITS IN FILL
	RFP PROPOSED LIMITED ACCESS LINE		16" W PROPOSED WATER RELOCATION
	RFP PROPOSED TEMPORARY EASEMENT		4" FM PROPOSED SEWER RELOCATION
	RFP PROPOSED PERMANENT EASEMENT		SFM SFM
	RFP PROPOSED RIGHT OF WAY		G NATURAL GAS
	2 INCH MIN. MILL AND OVERLAY		24" W EXISTING WATER
	4 INCH MIN. MILL AND OVERLAY		E EXISTING ELECTRIC
	6 INCH MIN. MILL AND OVERLAY		FO EXISTING FIBER OPTIC
	FULL DEPTH PAVEMENT		CAV EXISTING CABLE TV
	PAVEMENT DEMOLITION		T/Ts EXISTING TELEPHONE
	AREAS OF REDUCED ROW / EASEMENT IMPACTS		TC EXISTING TRAFFIC CONTROL
	POTENTIAL NOISE BARRIER		UK EXISTING UNKNOWN UTILITY
	PROPOSED FENCE		



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 8 OF 21

\$USER\$

\$DATE\$

\$FILE\$

PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**SB I-81 CURVE DATA**

PI = 589+69.66 DELTA = 07°37'51.81" (LT) D = 00°45'50" T = 500.19' L = 998.90' R = 7,500.00' PC = 584+69.47 PT = 594+68.37 e = 2.6% V = 65 MPH	PI = 601+39.92 DELTA = 01°49'11.73" (LT) D = 00°26'27" T = 206.48' L = 412.93' R = 13,000.00' PC = 599+33.44 PT = 603+46.37 e = NC V = 65 MPH	PI = 605+63.65 DELTA = 01°54'54.39" (RT) D = 00°26'27" T = 217.28' L = 434.52' R = 13,000.00' PC = 603+46.37 PT = 607+80.90 e = NC V = 65 MPH
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**DESIGN ENHANCEMENT**

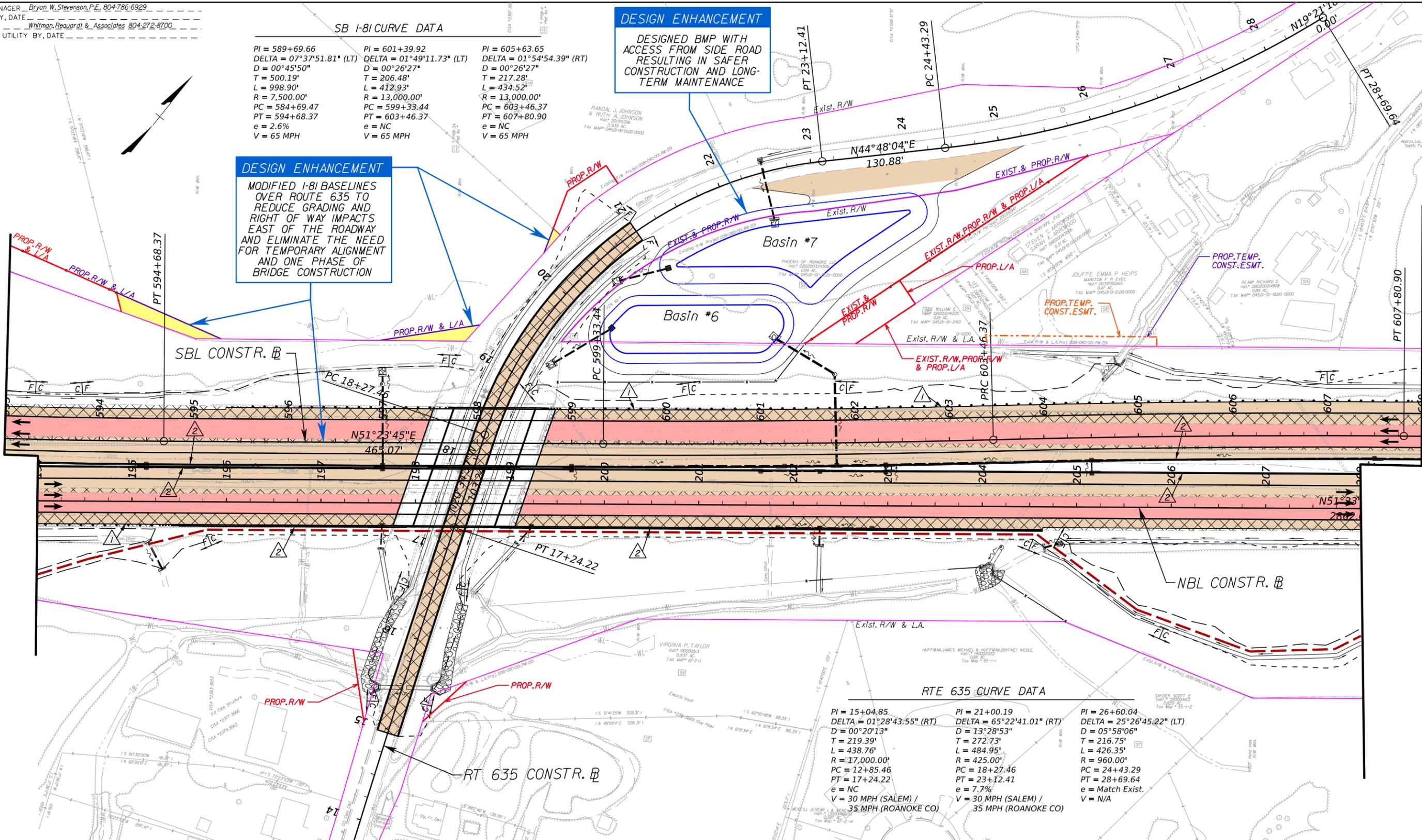
DESIGNED BMP WITH ACCESS FROM SIDE ROAD RESULTING IN SAFER CONSTRUCTION AND LONG-TERM MAINTENANCE

**DESIGN ENHANCEMENT**

MODIFIED I-81 BASELINES OVER ROUTE 635 TO REDUCE GRADING AND RIGHT OF WAY IMPACTS EAST OF THE ROADWAY AND ELIMINATE THE NEED FOR TEMPORARY ALIGNMENT AND ONE PHASE OF BRIDGE CONSTRUCTION

MATCHLINE STA. 593+00 SB, STA. 194+00 NB I-81 CONSTR. @ SEE SHEET 8

MATCHLINE STA. 608+00 SB, STA. 208+00 NB I-81 CONSTR. @ SEE SHEET 10

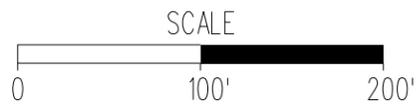


**RTE 635 CURVE DATA**

PI = 15+04.85 DELTA = 01°28'43.55" (RT) D = 00°20'13" T = 219.39' L = 438.76' R = 17,000.00' PC = 12+85.46 PT = 17+24.22 e = NC V = 30 MPH (SALEM) / 35 MPH (ROANOKE CO)	PI = 21+00.19 DELTA = 65°22'41.01" (RT) D = 13°28'53" T = 272.73' L = 484.95' R = 425.00' PC = 18+27.46 PT = 23+12.41 e = 7.7% V = 30 MPH (SALEM) / 35 MPH (ROANOKE CO)	PI = 26+60.04 DELTA = 25°26'45.22" (LT) D = 05°58'06" T = 216.75' L = 426.35' R = 960.00' PC = 24+43.29 PT = 28+69.64 e = Match Exist. V = N/A
---	--	---

**LEGEND:**

	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		2 INCH MIN. MILL AND OVERLAY		PROPOSED GUARDRAIL REQ'D		SFM	SFM
	EXISTING EASEMENT		4 INCH MIN. MILL AND OVERLAY		PROPOSED CONCRETE BARRIER REQ'D		G	NATURAL GAS
	PROPOSED LIMITED ACCESS LINE		6 INCH MIN. MILL AND OVERLAY		PROPOSED PIER PROTECTION BARRIER REQ'D		2PW	EXISTING WATER
	PROPOSED RIGHT OF WAY		FULL DEPTH PAVEMENT		PROPOSED RETAINING WALL REQ'D		E	EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		PAVEMENT DEMOLITION		PROPOSED CURBING REQ'D		F0	EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT		AREAS OF REDUCED ROW / EASEMENT IMPACTS		DENOTES CONSTRUCTION LIMITS IN CUT		CAV	EXISTING CABLE TV
	PROPOSED UTILITY EASEMENT		POTENTIAL NOISE BARRIER		DENOTES CONSTRUCTION LIMITS IN FILL		T/S	EXISTING TELEPHONE
	RFP PROPOSED LIMITED ACCESS LINE		PROPOSED FENCE				TC	EXISTING TRAFFIC CONTROL
	RFP PROPOSED TEMPORARY EASEMENT						UK	EXISTING UNKNOWN UTILITY
	RFP PROPOSED PERMANENT EASEMENT							
	RFP PROPOSED RIGHT OF WAY							



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 9 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**RT 619 CURVE DATA**

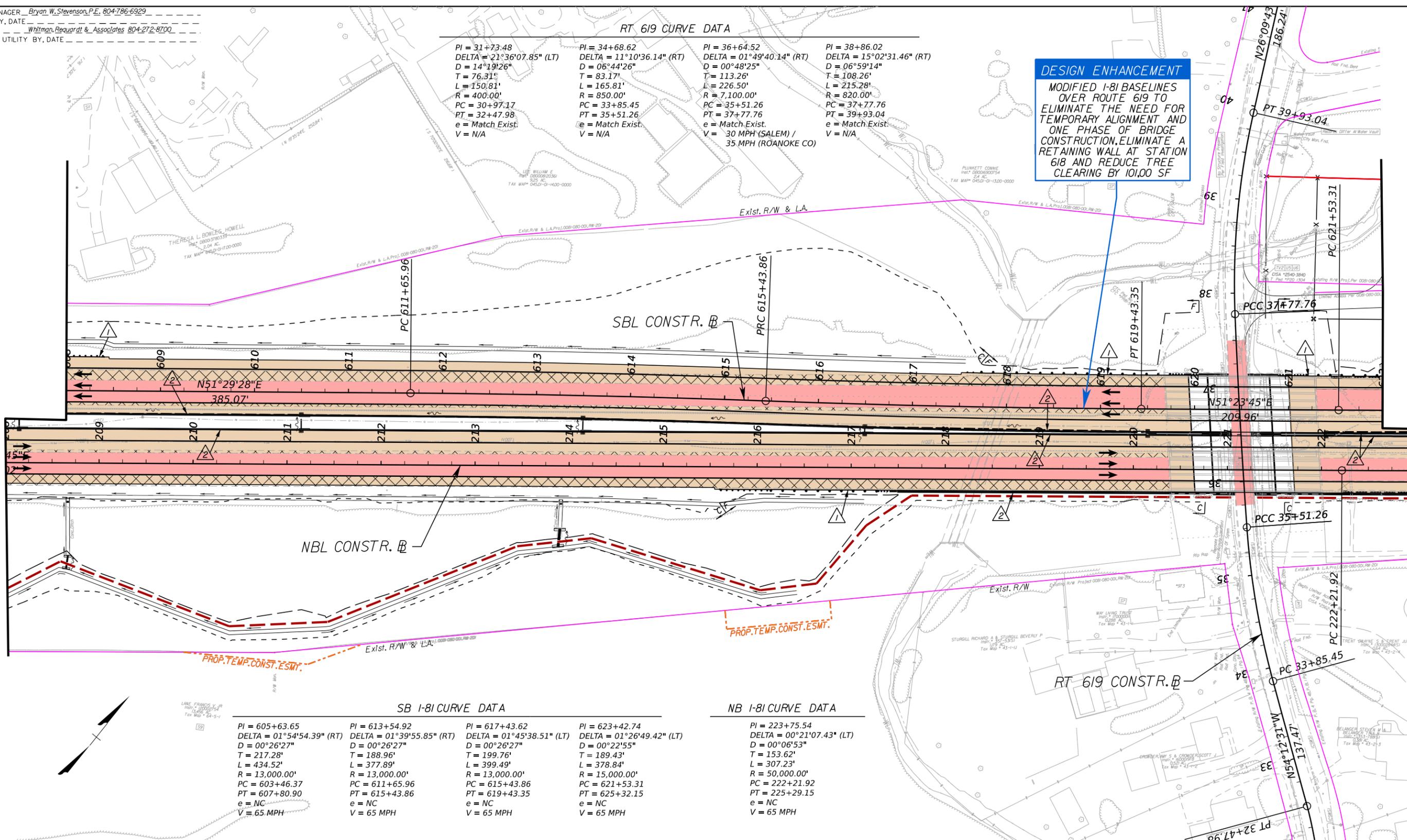
PI = 31+73.48 DELTA = 21°36'07.85" (LT) D = 14°19'26" T = 76.31' L = 150.81' R = 400.00' PC = 30+97.17 PT = 32+47.98 e = Match Exist. V = N/A	PI = 34+68.62 DELTA = 11°10'36.14" (RT) D = 06°44'26" T = 83.17' L = 165.81' R = 850.00' PC = 33+85.45 PT = 35+51.26 e = Match Exist. V = N/A	PI = 36+64.52 DELTA = 01°49'40.14" (RT) D = 00°48'25" T = 113.26' L = 226.50' R = 7,100.00' PC = 35+51.26 PT = 37+77.76 e = Match Exist. V = 30 MPH (SALEM) / 35 MPH (ROANOKE CO)	PI = 38+86.02 DELTA = 15°02'31.46" (RT) D = 06°59'14" T = 108.26' L = 215.28' R = 820.00' PC = 37+77.76 PT = 39+93.04 e = Match Exist. V = N/A
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**DESIGN ENHANCEMENT**

MODIFIED I-81 BASELINES  
 OVER ROUTE 619 TO  
 ELIMINATE THE NEED FOR  
 TEMPORARY ALIGNMENT AND  
 ONE PHASE OF BRIDGE  
 CONSTRUCTION, ELIMINATE A  
 RETAINING WALL AT STATION  
 618 AND REDUCE TREE  
 CLEARING BY 101,00 SF

MATCHLINE STA. 608+00 SB, STA. 208+00 NB  
 I-81 CONSTR. @ SEE SHEET 9

MATCHLINE STA. 622+00 SB, STA. 223+00 NB  
 I-81 CONSTR. @ SEE SHEET 11



**SB I-81 CURVE DATA**

PI = 605+63.65 DELTA = 01°54'54.39" (RT) D = 00°26'27" T = 217.28' L = 434.52' R = 13,000.00' PC = 603+46.37 PT = 607+80.90 e = NC V = 65 MPH	PI = 613+54.92 DELTA = 01°39'55.85" (RT) D = 00°26'27" T = 188.96' L = 377.89' R = 13,000.00' PC = 611+65.96 PT = 615+43.86 e = NC V = 65 MPH	PI = 617+43.62 DELTA = 01°45'38.51" (LT) D = 00°26'27" T = 199.76' L = 399.49' R = 13,000.00' PC = 615+43.86 PT = 619+43.35 e = NC V = 65 MPH	PI = 623+42.74 DELTA = 01°26'49.42" (LT) D = 00°22'55" T = 189.43' L = 378.84' R = 15,000.00' PC = 621+53.31 PT = 625+32.15 e = NC V = 65 MPH
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**NB I-81 CURVE DATA**

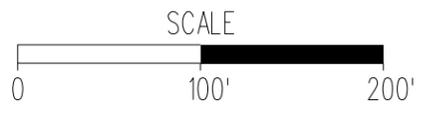
PI = 223+75.54 DELTA = 00°21'07.43" (LT) D = 00°06'53" T = 153.62' L = 307.23' R = 50,000.00' PC = 222+21.92 PT = 225+29.15 e = NC V = 65 MPH
--

- LEGEND:**
- EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
  - EXISTING EASEMENT
  - PROPOSED LIMITED ACCESS LINE
  - PROPOSED RIGHT OF WAY
  - PROPOSED TEMPORARY EASEMENT
  - PROPOSED PERMANENT EASEMENT
  - PROPOSED UTILITY EASEMENT
  - RFP PROPOSED LIMITED ACCESS LINE
  - RFP PROPOSED TEMPORARY EASEMENT
  - RFP PROPOSED PERMANENT EASEMENT
  - RFP PROPOSED RIGHT OF WAY

- 2 INCH MIN. MILL AND OVERLAY
- 4 INCH MIN. MILL AND OVERLAY
- 6 INCH MIN. MILL AND OVERLAY
- FULL DEPTH PAVEMENT
- PAVEMENT DEMOLITION
- AREAS OF REDUCED ROW / EASEMENT IMPACTS
- POTENTIAL NOISE BARRIER
- PROPOSED FENCE

- PROPOSED GUARDRAIL REQ'D
- PROPOSED CONCRETE BARRIER REQ'D
- PROPOSED PIER PROTECTION BARRIER REQ'D
- PROPOSED RETAINING WALL REQ'D
- PROPOSED CURBING REQ'D
- Denotes CONSTRUCTION LIMITS IN CUT
- Denotes CONSTRUCTION LIMITS IN FILL
- PROPOSED WATER RELOCATION
- PROPOSED SEWER RELOCATION

- SFM - SFM
- G - NATURAL GAS
- 2PW - EXISTING WATER
- E - EXISTING ELECTRIC
- FO - EXISTING FIBER OPTIC
- CAV - EXISTING CABLE TV
- T/S - EXISTING TELEPHONE
- TC - EXISTING TRAFFIC CONTROL
- UK - EXISTING UNKNOWN UTILITY



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 10 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Requardt & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**NB I-81 CURVE DATA**

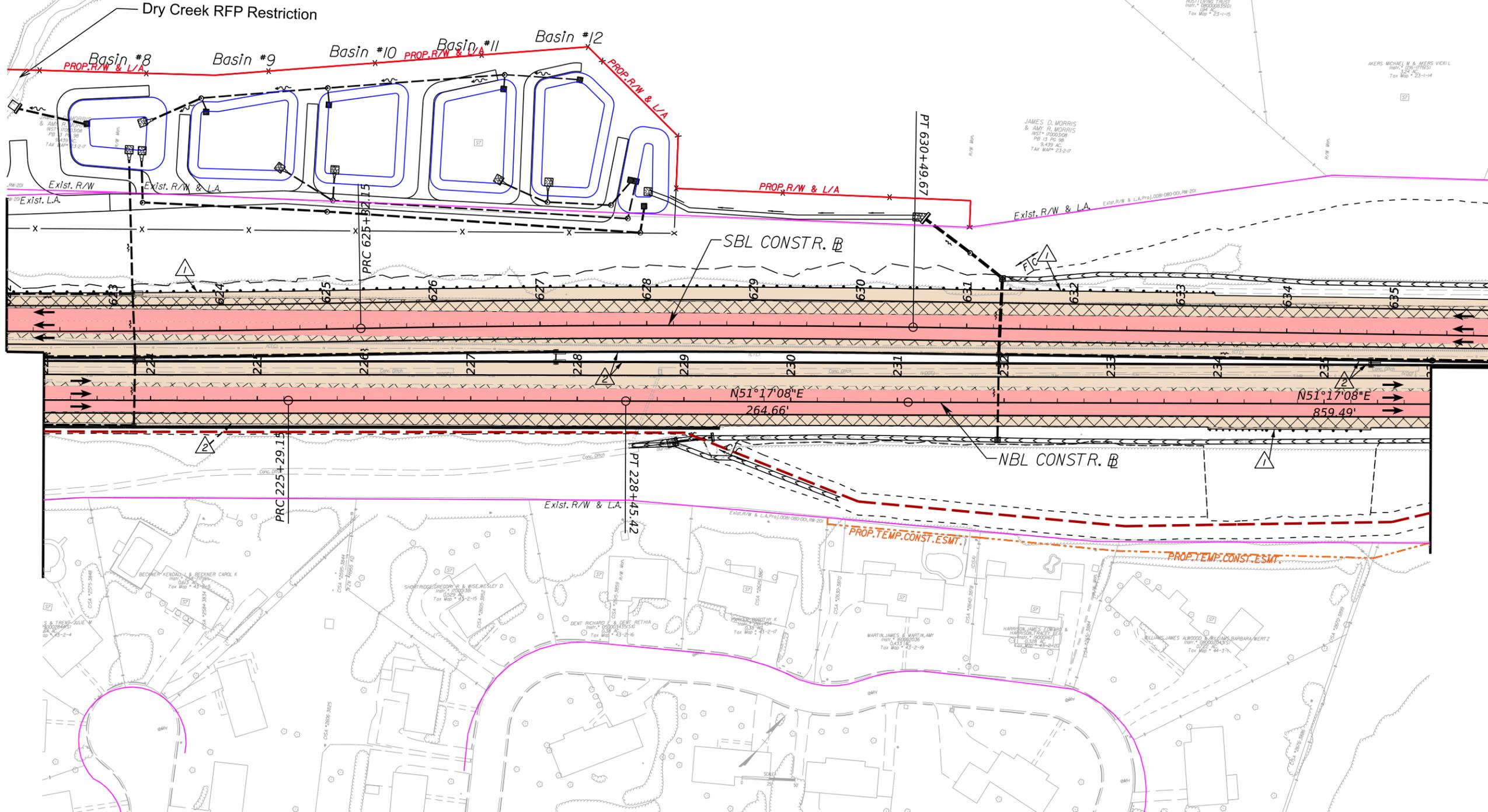
PI = 223+75.54	PI = 226+87.29
DELTA = 00°21'07.43" (LT)	DELTA = 00°14'29.80" (RT)
D = 00°06'53"	D = 00°04'35"
T = 153.62'	T = 158.14'
L = 307.23'	L = 316.27'
R = 50,000.00'	R = 75,000.00'
PC = 222+21.92	PC = 225+29.15
PT = 225+29.15	PT = 228+45.42
e = NC	e = NC
V = 65 MPH	V = 65 MPH

**SB I-81 CURVE DATA**

PI = 623+42.74	PI = 627+90.93
DELTA = 01°26'49.42" (LT)	DELTA = 01°58'36.34" (RT)
D = 00°22'55"	D = 00°22'55"
T = 189.43'	T = 258.78'
L = 378.84'	L = 517.51'
R = 15,000.00'	R = 15,000.00'
PC = 621+53.31	PC = 625+32.15
PT = 625+32.15	PT = 630+49.67
e = NC	e = NC
V = 65 MPH	V = 65 MPH

MATCHLINE STA. 622+00 SB, STA. 223+00 NB  
I-81 CONSTR. @ SEE SHEET 10

MATCHLINE STA. 636+00 SB, STA. 236+00 NB  
I-81 CONSTR. @ SEE SHEET 12

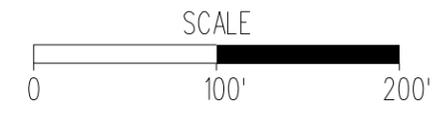


- LEGEND:**
- EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
  - EXISTING EASEMENT
  - PROPOSED LIMITED ACCESS LINE
  - PROPOSED RIGHT OF WAY
  - PROPOSED TEMPORARY EASEMENT
  - PROPOSED PERMANENT EASEMENT
  - PROPOSED UTILITY EASEMENT
  - RFP PROPOSED LIMITED ACCESS LINE
  - RFP PROPOSED TEMPORARY EASEMENT
  - RFP PROPOSED PERMANENT EASEMENT
  - RFP PROPOSED RIGHT OF WAY

- 2 INCH MIN. MILL AND OVERLAY
- 4 INCH MIN. MILL AND OVERLAY
- 6 INCH MIN. MILL AND OVERLAY
- FULL DEPTH PAVEMENT
- PAVEMENT DEMOLITION
- AREAS OF REDUCED ROW / EASEMENT IMPACTS
- POTENTIAL NOISE BARRIER
- X PROPOSED FENCE

- 1 PROPOSED GUARDRAIL REQ'D
- 2 PROPOSED CONCRETE BARRIER REQ'D
- 3 PROPOSED PIER PROTECTION BARRIER REQ'D
- 4 PROPOSED RETAINING WALL REQ'D
- 5 PROPOSED CURBING REQ'D
- C DENOTES CONSTRUCTION LIMITS IN CUT
- F DENOTES CONSTRUCTION LIMITS IN FILL
- +16" W PROPOSED WATER RELOCATION
- 4" FM PROPOSED SEWER RELOCATION

- SFM SFM
- G NATURAL GAS
- 24" W EXISTING WATER
- E EXISTING ELECTRIC
- FO EXISTING FIBER OPTIC
- CATV EXISTING CABLE TV
- T/S EXISTING TELEPHONE
- TC EXISTING TRAFFIC CONTROL
- UK EXISTING UNKNOWN UTILITY



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 11 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**NB I-81 CURVE DATA**

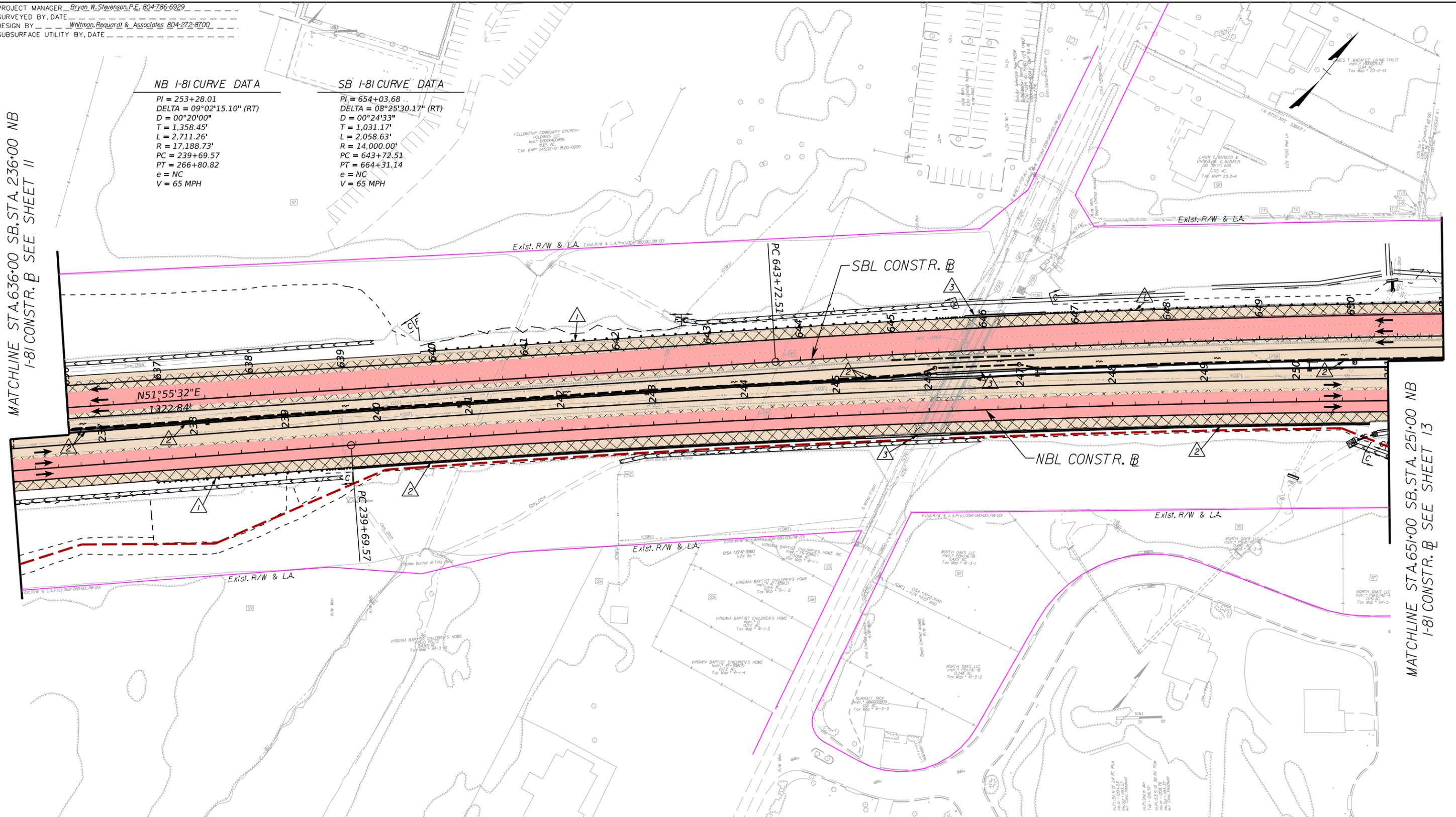
PI = 253+28.01  
 DELTA = 09°02'15.10" (RT)  
 D = 00°20'00"  
 T = 1,358.45'  
 L = 2,711.26'  
 R = 17,188.73'  
 PC = 239+69.57  
 PT = 266+80.82  
 e = NC  
 V = 65 MPH

**SB I-81 CURVE DATA**

PI = 654+03.68  
 DELTA = 08°25'30.17" (RT)  
 D = 00°24'33"  
 T = 1,031.17'  
 L = 2,058.63'  
 R = 14,000.00'  
 PC = 643+72.51  
 PT = 664+31.14  
 e = NC  
 V = 65 MPH

MATCHLINE STA. 636+00 SB, STA. 236+00 NB  
I-81 CONSTR. B SEE SHEET 11

MATCHLINE STA. 651+00 SB, STA. 251+00 NB  
I-81 CONSTR. B SEE SHEET 13

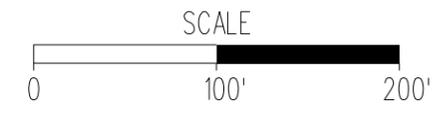


- LEGEND:**
- EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
  - EXISTING EASEMENT
  - PROPOSED LIMITED ACCESS LINE
  - PROPOSED RIGHT OF WAY
  - PROPOSED TEMPORARY EASEMENT
  - PROPOSED PERMANENT EASEMENT
  - PROPOSED UTILITY EASEMENT
  - RFP PROPOSED LIMITED ACCESS LINE
  - RFP PROPOSED TEMPORARY EASEMENT
  - RFP PROPOSED PERMANENT EASEMENT
  - RFP PROPOSED RIGHT OF WAY

- 2 INCH MIN. MILL AND OVERLAY
- 4 INCH MIN. MILL AND OVERLAY
- 6 INCH MIN. MILL AND OVERLAY
- FULL DEPTH PAVEMENT
- PAVEMENT DEMOLITION
- AREAS OF REDUCED ROW / EASEMENT IMPACTS
- POTENTIAL NOISE BARRIER
- X- PROPOSED FENCE

- 1 PROPOSED GUARDRAIL REQ'D
- 2 PROPOSED CONCRETE BARRIER REQ'D
- 3 PROPOSED PIER PROTECTION BARRIER REQ'D
- 4 PROPOSED RETAINING WALL REQ'D
- 5 PROPOSED CURBING REQ'D
- C DENOTES CONSTRUCTION LIMITS IN CUT
- F DENOTES CONSTRUCTION LIMITS IN FILL
- +16" W PROPOSED WATER RELOCATION
- 4" FM PROPOSED SEWER RELOCATION

- SFM SFM
- G NATURAL GAS
- 24" W EXISTING WATER
- E EXISTING ELECTRIC
- FO EXISTING FIBER OPTIC
- CATV EXISTING CABLE TV
- T/Ts EXISTING TELEPHONE
- TC EXISTING TRAFFIC CONTROL
- U- UNKNOWN EXISTING UNKNOWN UTILITY



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 12 OF 21

\$USER\$

\$DATE\$

\$FILE\$

PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reed & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

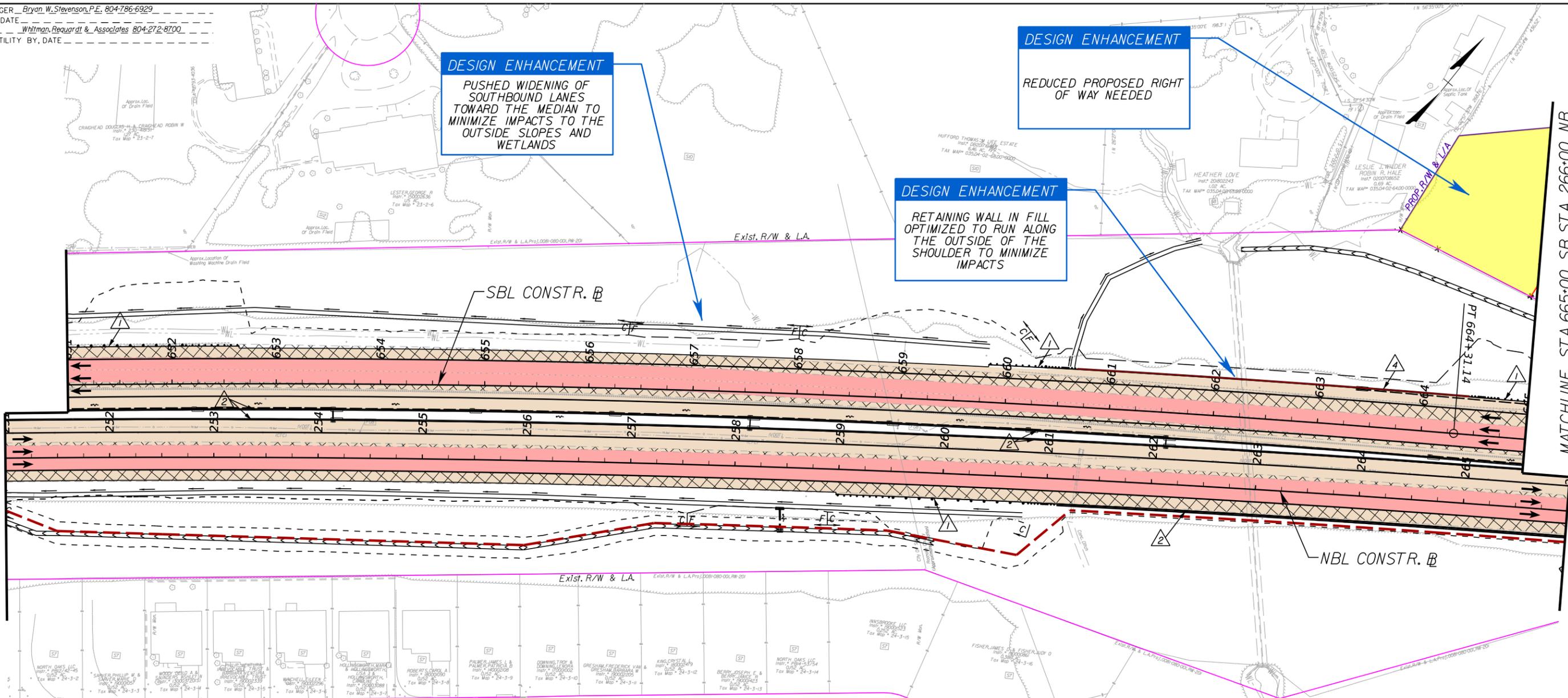
**DESIGN ENHANCEMENT**  
 PUSHED WIDENING OF  
 SOUTHBOUND LANES  
 TOWARD THE MEDIAN TO  
 MINIMIZE IMPACTS TO THE  
 OUTSIDE SLOPES AND  
 WETLANDS

**DESIGN ENHANCEMENT**  
 REDUCED PROPOSED RIGHT  
 OF WAY NEEDED

**DESIGN ENHANCEMENT**  
 RETAINING WALL IN FILL  
 OPTIMIZED TO RUN ALONG  
 THE OUTSIDE OF THE  
 SHOULDER TO MINIMIZE  
 IMPACTS

MATCHLINE STA. 651+00 SB, STA. 251+00 NB  
 I-81 CONSTR. SEE SHEET 12

MATCHLINE STA. 665+00 SB, STA. 266+00 NB  
 I-81 CONSTR. SEE SHEET 14



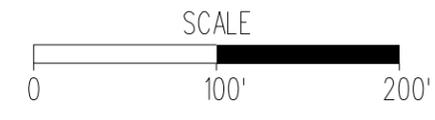
**NB I-81 CURVE DATA**

PI = 253+28.01  
 DELTA = 09°02'15.10" (RT)  
 D = 00°20'00"  
 T = 1,358.45'  
 L = 2,711.26'  
 R = 17,188.73'  
 PC = 239+69.57  
 PT = 266+80.82  
 e = NC  
 V = 65 MPH

**SB I-81 CURVE DATA**

PI = 654+03.68  
 DELTA = 08°25'30.17" (RT)  
 D = 00°24'33"  
 T = 1,031.17'  
 L = 2,058.63'  
 R = 14,000.00'  
 PC = 643+72.51  
 PT = 664+31.14  
 e = NC  
 V = 65 MPH

LEGEND:	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE
	EXISTING EASEMENT
	PROPOSED LIMITED ACCESS LINE
	PROPOSED RIGHT OF WAY
	PROPOSED TEMPORARY EASEMENT
	PROPOSED PERMANENT EASEMENT
	PROPOSED UTILITY EASEMENT
	RFP PROPOSED LIMITED ACCESS LINE
	RFP PROPOSED TEMPORARY EASEMENT
	RFP PROPOSED PERMANENT EASEMENT
	RFP PROPOSED RIGHT OF WAY
	2 INCH MIN. MILL AND OVERLAY
	4 INCH MIN. MILL AND OVERLAY
	6 INCH MIN. MILL AND OVERLAY
	FULL DEPTH PAVEMENT
	PAVEMENT DEMOLITION
	AREAS OF REDUCED ROW / EASEMENT IMPACTS
	POTENTIAL NOISE BARRIER
	PROPOSED FENCE
	PROPOSED GUARDRAIL REQ'D
	PROPOSED CONCRETE BARRIER REQ'D
	PROPOSED PIER PROTECTION BARRIER REQ'D
	PROPOSED RETAINING WALL REQ'D
	PROPOSED CURBING REQ'D
	DENOTES CONSTRUCTION LIMITS IN CUT
	DENOTES CONSTRUCTION LIMITS IN FILL
	PROPOSED WATER RELOCATION
	PROPOSED SEWER RELOCATION
	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 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 13 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**DESIGN ENHANCEMENT**  
 RETAINING WALL IN FILL OPTIMIZED TO RUN ALONG THE OUTSIDE OF THE SHOULDER TO MINIMIZE IMPACTS

**RTE 311 RAMP D CURVE DATA**  
 PI = 2307+20.78  
 DELTA = 56°54'10.92" (RT)  
 D = 17°54'18"  
 T = 173.40'  
 L = 317.81'  
 R = 320.00'  
 PC = 2305+47.39  
 PT = 2308+65.19  
 e = 8%  
 V = 35 MPH

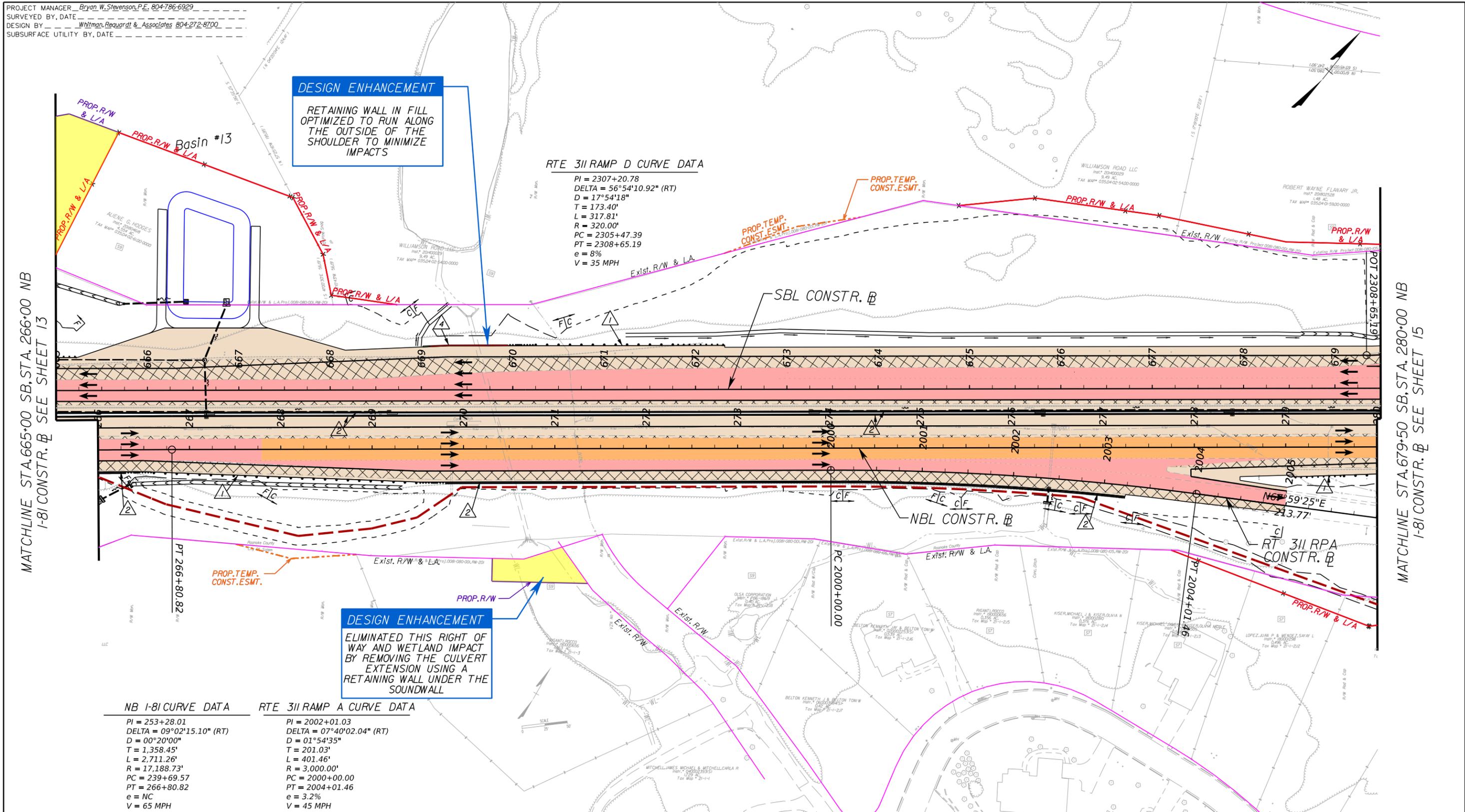
**DESIGN ENHANCEMENT**  
 ELIMINATED THIS RIGHT OF WAY AND WETLAND IMPACT BY REMOVING THE CULVERT EXTENSION USING A RETAINING WALL UNDER THE SOUNDWALL

**NB I-81 CURVE DATA**  
 PI = 253+28.01  
 DELTA = 09°02'15.10" (RT)  
 D = 00°20'00"  
 T = 1,358.45'  
 L = 2,711.26'  
 R = 17,188.73'  
 PC = 239+69.57  
 PT = 266+80.82  
 e = NC  
 V = 65 MPH

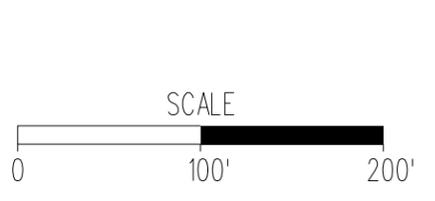
**RTE 311 RAMP A CURVE DATA**  
 PI = 2002+01.03  
 DELTA = 07°40'02.04" (RT)  
 D = 01°54'35"  
 T = 201.03'  
 L = 401.46'  
 R = 3,000.00'  
 PC = 2000+00.00  
 PT = 2004+01.46  
 e = 3.2%  
 V = 45 MPH

MATCHLINE STA. 665+00 SB, STA. 266+00 NB  
I-81 CONSTR. B SEE SHEET 13

MATCHLINE STA. 679+50 SB, STA. 280+00 NB  
I-81 CONSTR. B SEE SHEET 15



LEGEND:		UTILITIES	
	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		SFW
	EXISTING EASEMENT		NATURAL GAS
	PROPOSED LIMITED ACCESS LINE		EXISTING WATER
	PROPOSED RIGHT OF WAY		EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT		EXISTING CABLE TV
	PROPOSED UTILITY EASEMENT		EXISTING TELEPHONE
	RFP PROPOSED LIMITED ACCESS LINE		EXISTING TRAFFIC CONTROL
	RFP PROPOSED TEMPORARY EASEMENT		EXISTING UNKNOWN UTILITY
	RFP PROPOSED PERMANENT EASEMENT		
	RFP PROPOSED RIGHT OF WAY		
	2 INCH MIN. MILL AND OVERLAY		PROPOSED GUARDRAIL REQ'D
	4 INCH MIN. MILL AND OVERLAY		PROPOSED CONCRETE BARRIER REQ'D
	6 INCH MIN. MILL AND OVERLAY		PROPOSED PIER PROTECTION BARRIER REQ'D
	FULL DEPTH PAVEMENT		PROPOSED RETAINING WALL REQ'D
	PAVEMENT DEMOLITION		PROPOSED CURBING REQ'D
	AREAS OF REDUCED ROW / EASEMENT IMPACTS		DENOTES CONSTRUCTION LIMITS IN CUT
	POTENTIAL NOISE BARRIER		DENOTES CONSTRUCTION LIMITS IN FILL
	PROPOSED FENCE		16" W PROPOSED WATER RELOCATION
			4" FM PROPOSED SEWER RELOCATION



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 14 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**RTE 311 RAMP D CURVE DATA**

PI = 2303+09.80  
 DELTA = 75°31'38.10" (LT)  
 D = 16°51'06"  
 T = 263.39'  
 L = 448.19'  
 R = 340.00'  
 PC = 2300+46.42  
 PT = 2304+94.61  
 e = Match Exist.  
 V = N/A

**RTE 311 LOOP D CURVE DATA**

PI = 2203+44.22  
 DELTA = 137°10'13.11" (RT)  
 D = 42°26'29"  
 T = 344.22'  
 L = 323.20'  
 R = 135.00'  
 PC = 2200+00.00  
 PT = 2203+23.20  
 e = 8%  
 V = 25 MPH

PI = 2204+25.08  
 DELTA = 46°52'39.05" (RT)  
 D = 24°22'52"  
 T = 101.88'  
 L = 192.27'  
 R = 235.00'  
 PC = 2203+23.20  
 PT = 2205+15.47  
 e = Match Exist.  
 V = N/A

**RTE 311 RAMP A CURVE DATA**

PI = 2007+74.71  
 DELTA = 04°27'19.27" (LT)  
 D = 01°23'51"  
 T = 159.49'  
 L = 318.82'  
 R = 4,100.00'  
 PC = 2006+15.22  
 PT = 2009+34.04  
 e = Match Exist.  
 V = N/A

**RTE 311 RAMP B CURVE DATA**

PI = 2104+03.39  
 DELTA = 03°05'41.80" (LT)  
 D = 01°01'40"  
 T = 150.61'  
 L = 301.14'  
 R = 5,575.00'  
 PC = 2102+52.78  
 PT = 2105+53.92  
 e = Match Exist.  
 V = N/A

PI = 2109+01.82  
 DELTA = 07°29'32.27" (RT)  
 D = 01°47'26"  
 T = 209.52'  
 L = 418.45'  
 R = 3,200.00'  
 PC = 2106+92.30  
 PT = 2111+10.75  
 e = 3%  
 V = 45 MPH

MATCHLINE STA. 679+50 SB, STA. 280+00 NB  
 I-81 CONSTR. SEE SHEET 14

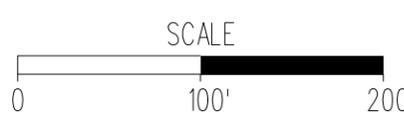
MATCHLINE STA. 694+00 SB, STA. 295+00 NB  
 I-81 CONSTR. SEE SHEET 16

\$USER\$  
 \$TIME\$  
 \$DATE\$

**LEGEND:**

	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		2 INCH MIN. MILL AND OVERLAY		PROPOSED GUARDRAIL REQ'D		SFW
	EXISTING EASEMENT		4 INCH MIN. MILL AND OVERLAY		PROPOSED CONCRETE BARRIER REQ'D		NATURAL GAS
	PROPOSED LIMITED ACCESS LINE		6 INCH MIN. MILL AND OVERLAY		PROPOSED PIER PROTECTION BARRIER REQ'D		EXISTING WATER
	PROPOSED RIGHT OF WAY		FULL DEPTH PAVEMENT		PROPOSED RETAINING WALL REQ'D		EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		PAVEMENT DEMOLITION		PROPOSED CURBING REQ'D		EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT		AREAS OF REDUCED ROW / EASEMENT IMPACTS		PROPOSED FENCE		EXISTING CABLE TV
	PROPOSED UTILITY EASEMENT		POTENTIAL NOISE BARRIER				EXISTING TELEPHONE
	RFP PROPOSED LIMITED ACCESS LINE		POTENTIAL NOISE BARRIER				EXISTING TRAFFIC CONTROL
	RFP PROPOSED TEMPORARY EASEMENT		POTENTIAL NOISE BARRIER				EXISTING UNKNOWN UTILITY
	RFP PROPOSED PERMANENT EASEMENT		POTENTIAL NOISE BARRIER				
	RFP PROPOSED RIGHT OF WAY		POTENTIAL NOISE BARRIER				

PROPOSED WATER RELOCATION |  | PROPOSED SEWER RELOCATION |



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 15 OF 21

**BRANCH CIVIL** **ORDERS CONSTRUCTION COMPANY**

PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**NB I-81 CURVE DATA**

PI = 310+44.40  
 DELTA = 16°06'22.16" (RT)  
 D = 00°45'00"  
 T = 1,080.87'  
 L = 2,147.49'  
 R = 7,639.44'  
 PC = 299+63.53  
 PT = 321+11.02  
 e = 2.5%  
 V = 65 MPH

**SB I-81 CURVE DATA**

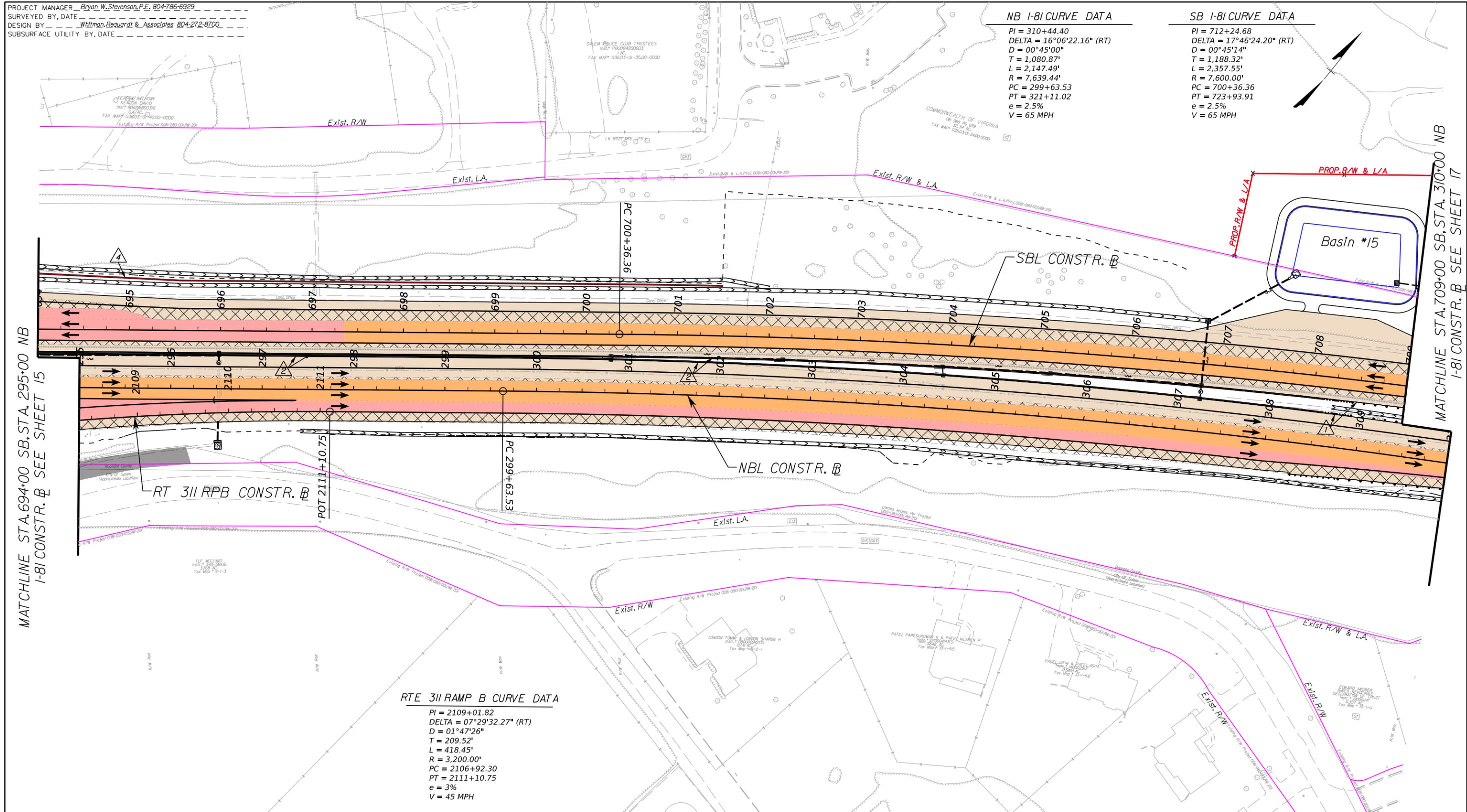
PI = 712+24.68  
 DELTA = 17°46'24.20" (RT)  
 D = 00°45'14"  
 T = 1,188.32'  
 L = 2,357.55'  
 R = 7,600.00'  
 PC = 700+36.36  
 PT = 723+93.91  
 e = 2.5%  
 V = 65 MPH

**RTE 311 RAMP B CURVE DATA**

PI = 2109+01.82  
 DELTA = 07°29'32.27" (RT)  
 D = 01°47'26"  
 T = 209.52'  
 L = 418.45'  
 R = 3,200.00'  
 PC = 2106+92.30  
 PT = 2111+10.75  
 e = 3%  
 V = 45 MPH

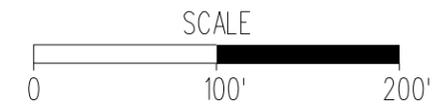
MATCHLINE STA. 694+00 SB, STA. 295+00 NB  
I-81 CONSTR. B SEE SHEET 15

MATCHLINE STA. 709+00 SB, STA. 310+00 NB  
I-81 CONSTR. B SEE SHEET 17



**LEGEND:**

	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		4 INCH MIN. MILL AND OVERLAY		PROPOSED GUARDRAIL REQ'D		SFW
	EXISTING EASEMENT		6 INCH MIN. MILL AND OVERLAY		PROPOSED CONCRETE BARRIER REQ'D		NATURAL GAS
	PROPOSED LIMITED ACCESS LINE		FULL DEPTH PAVEMENT		PROPOSED PIER PROTECTION BARRIER REQ'D		EXISTING WATER
	PROPOSED RIGHT OF WAY		PAVEMENT DEMOLITION		PROPOSED RETAINING WALL REQ'D		EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		AREAS OF REDUCED ROW / EASEMENT IMPACTS		PROPOSED CURBING REQ'D		EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT		POTENTIAL NOISE BARRIER		DENOTES CONSTRUCTION LIMITS IN CUT		EXISTING CABLE TV
	PROPOSED UTILITY EASEMENT		PROPOSED FENCE		DENOTES CONSTRUCTION LIMITS IN FILL		EXISTING TELEPHONE
	RFP PROPOSED LIMITED ACCESS LINE				PROPOSED WATER RELOCATION		EXISTING TRAFFIC CONTROL
	RFP PROPOSED TEMPORARY EASEMENT				PROPOSED SEWER RELOCATION		EXISTING UNKNOWN UTILITY
	RFP PROPOSED PERMANENT EASEMENT						
	RFP PROPOSED RIGHT OF WAY						



**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 16 OF 21

PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**NB I-81 CURVE DATA**

PI = 310+44.40	PI = 324+04.52
DELTA = 16°06'22.16" (RT)	DELTA = 05°16'19.37" (RT)
D = 00°45'00"	D = 00°53'56"
T = 1,080.87'	T = 293.50'
L = 2,147.49'	L = 586.59'
R = 7,639.44'	R = 6,375.00'
PC = 299+63.53	PC = 321+11.02
PT = 321+11.02	PT = 326+97.61
e = 2.5%	e = 3%
V = 65 MPH	V = 65 MPH

**SB I-81 CURVE DATA**

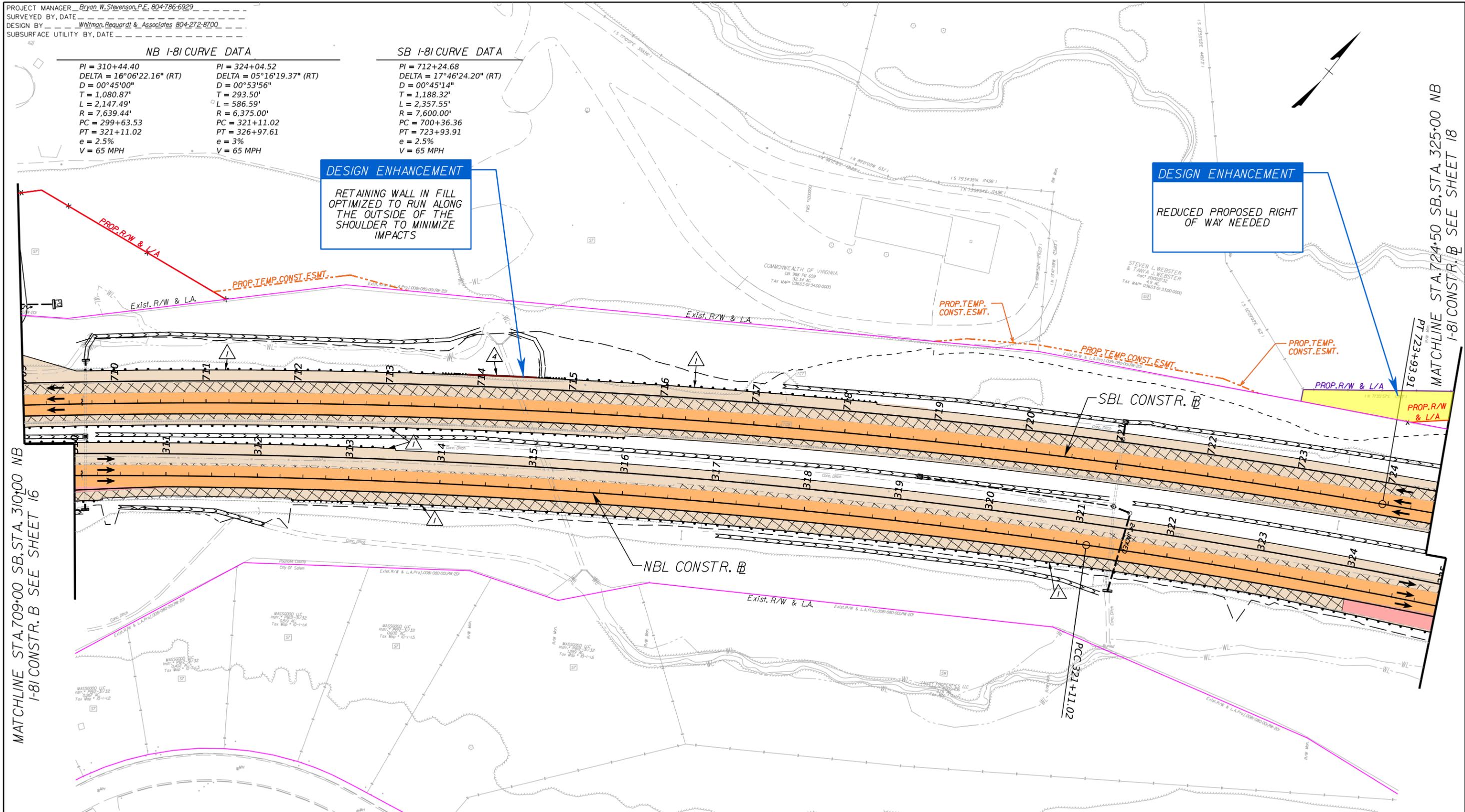
PI = 712+24.68	PI = 712+24.68
DELTA = 17°46'24.20" (RT)	DELTA = 17°46'24.20" (RT)
D = 00°45'14"	D = 00°45'14"
T = 1,188.32'	T = 1,188.32'
L = 2,357.55'	L = 2,357.55'
R = 7,600.00'	R = 7,600.00'
PC = 700+36.36	PC = 700+36.36
PT = 723+93.91	PT = 723+93.91
e = 2.5%	e = 2.5%
V = 65 MPH	V = 65 MPH

**DESIGN ENHANCEMENT**

RETAINING WALL IN FILL OPTIMIZED TO RUN ALONG THE OUTSIDE OF THE SHOULDER TO MINIMIZE IMPACTS

**DESIGN ENHANCEMENT**

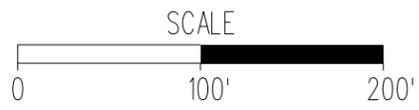
REDUCED PROPOSED RIGHT OF WAY NEEDED



MATCHLINE STA. 709+00 SB, STA. 310+00 NB I-81 CONSTR. B SEE SHEET 16

MATCHLINE STA. 724+50 SB, STA. 325+00 NB I-81 CONSTR. @ SEE SHEET 18

<b>LEGEND:</b>	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	2 INCH MIN. MILL AND OVERLAY	PROPOSED GUARDRAIL REQ'D	SFW
EXISTING EASEMENT	4 INCH MIN. MILL AND OVERLAY	PROPOSED CONCRETE BARRIER REQ'D	NATURAL GAS	EXISTING WATER
PROPOSED LIMITED ACCESS LINE	6 INCH MIN. MILL AND OVERLAY	PROPOSED PIER PROTECTION BARRIER REQ'D	EXISTING ELECTRIC	EXISTING FIBER OPTIC
PROPOSED RIGHT OF WAY	FULL DEPTH PAVEMENT	PROPOSED RETAINING WALL REQ'D	EXISTING CABLE TV	EXISTING TELEPHONE
PROPOSED TEMPORARY EASEMENT	PAVEMENT DEMOLITION	PROPOSED CURBING REQ'D	EXISTING TRAFFIC CONTROL	EXISTING UNKNOWN UTILITY
PROPOSED PERMANENT EASEMENT	AREAS OF REDUCED ROW / EASEMENT IMPACTS	DENOTES CONSTRUCTION LIMITS IN CUT		
PROPOSED UTILITY EASEMENT	POTENTIAL NOISE BARRIER	DENOTES CONSTRUCTION LIMITS IN FILL		
RFP PROPOSED LIMITED ACCESS LINE	PROPOSED FENCE	16" W PROPOSED WATER RELOCATION		
RFP PROPOSED TEMPORARY EASEMENT		4" FM PROPOSED SEWER RELOCATION		
RFP PROPOSED PERMANENT EASEMENT				
RFP PROPOSED RIGHT OF WAY				



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 17 OF 21

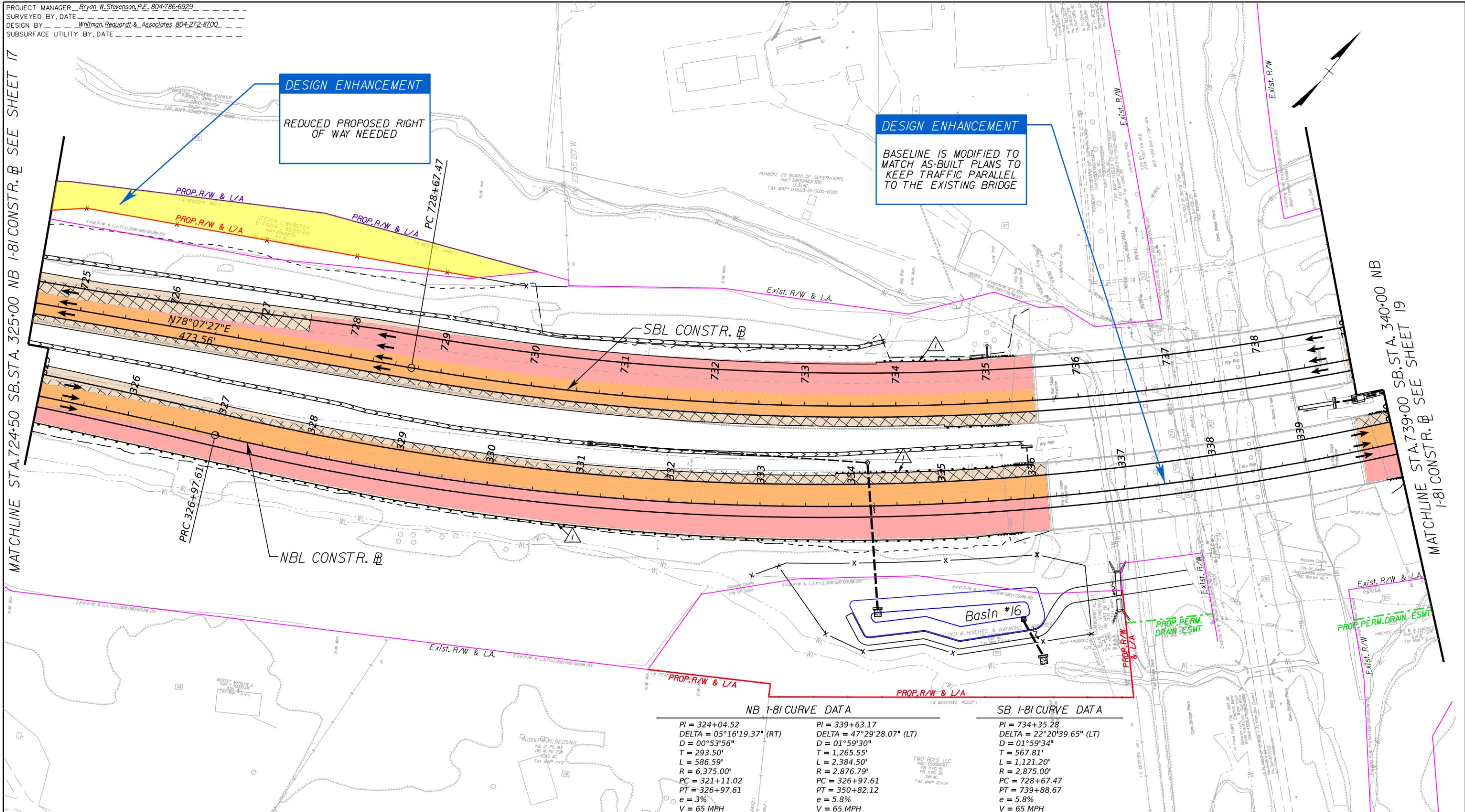


MATCHLINE STA. 724+50 SB, STA. 325+00 NB I-81 CONSTR. @ SEE SHEET 17

MATCHLINE STA. 739+00 SB, STA. 340+00 NB I-81 CONSTR. @ SEE SHEET 19

**DESIGN ENHANCEMENT**  
 REDUCED PROPOSED RIGHT OF WAY NEEDED

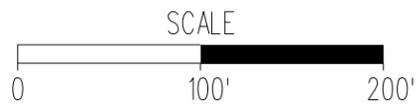
**DESIGN ENHANCEMENT**  
 BASELINE IS MODIFIED TO MATCH AS-BUILT PLANS TO KEEP TRAFFIC PARALLEL TO THE EXISTING BRIDGE



NB I-81 CURVE DATA		SB I-81 CURVE DATA	
PI = 324+04.52	PI = 339+63.17	PI = 734+35.28	PI = 734+35.28
DELTA = 05°16'19.37" (RT)	DELTA = 47°29'28.07" (LT)	DELTA = 22°20'39.65" (LT)	DELTA = 22°20'39.65" (LT)
D = 00°53'56"	D = 01°59'30"	D = 01°59'34"	D = 01°59'34"
T = 293.50'	T = 1,265.55'	T = 567.81'	T = 567.81'
L = 586.59'	L = 2,384.50'	L = 1,121.20'	L = 1,121.20'
R = 6,375.00'	R = 2,876.79'	R = 2,875.00'	R = 2,875.00'
PC = 321+11.02	PC = 326+97.61	PC = 728+67.47	PC = 728+67.47
PT = 326+97.61	PT = 350+82.12	PT = 739+88.67	PT = 739+88.67
e = 3%	e = 5.8%	e = 5.8%	e = 5.8%
V = 65 MPH			

**LEGEND:**

	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		2 INCH MIN. MILL AND OVERLAY		PROPOSED GUARDRAIL REQ'D		SFW
	EXISTING EASEMENT		4 INCH MIN. MILL AND OVERLAY		PROPOSED CONCRETE BARRIER REQ'D		NATURAL GAS
	PROPOSED LIMITED ACCESS LINE		6 INCH MIN. MILL AND OVERLAY		PROPOSED PIER PROTECTION BARRIER REQ'D		EXISTING WATER
	PROPOSED RIGHT OF WAY		FULL DEPTH PAVEMENT		PROPOSED RETAINING WALL REQ'D		EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		PAVEMENT DEMOLITION		PROPOSED CURBING REQ'D		EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT		AREAS OF REDUCED ROW / EASEMENT IMPACTS		DENOTES CONSTRUCTION LIMITS IN CUT		EXISTING CABLE TV
	PROPOSED UTILITY EASEMENT		POTENTIAL NOISE BARRIER		DENOTES CONSTRUCTION LIMITS IN FILL		EXISTING TELEPHONE
	RFP PROPOSED LIMITED ACCESS LINE		PROPOSED FENCE		PROPOSED WATER RELOCATION		EXISTING TRAFFIC CONTROL
	RFP PROPOSED TEMPORARY EASEMENT				PROPOSED SEWER RELOCATION		EXISTING UNKNOWN UTILITY
	RFP PROPOSED PERMANENT EASEMENT						
	RFP PROPOSED RIGHT OF WAY						



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 18 OF 21



PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Requardt & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**NB I-81 CURVE DATA**

PI = 339+63.17	PI = 356+77.62
DELTA = 47°29'28.07" (LT)	DELTA = 04°31'28.15" (RT)
D = 01°59'30"	D = 00°29'54"
T = 1,265.55'	T = 454.30'
L = 2,384.50'	L = 908.12'
R = 2,876.79'	R = 11,500.00'
PC = 326+97.61	PC = 352+23.33
PT = 350+82.12	PT = 361+31.45
e = 5.8%	e = 2%
V = 65 MPH	V = 65 MPH

**SB I-81 CURVE DATA**

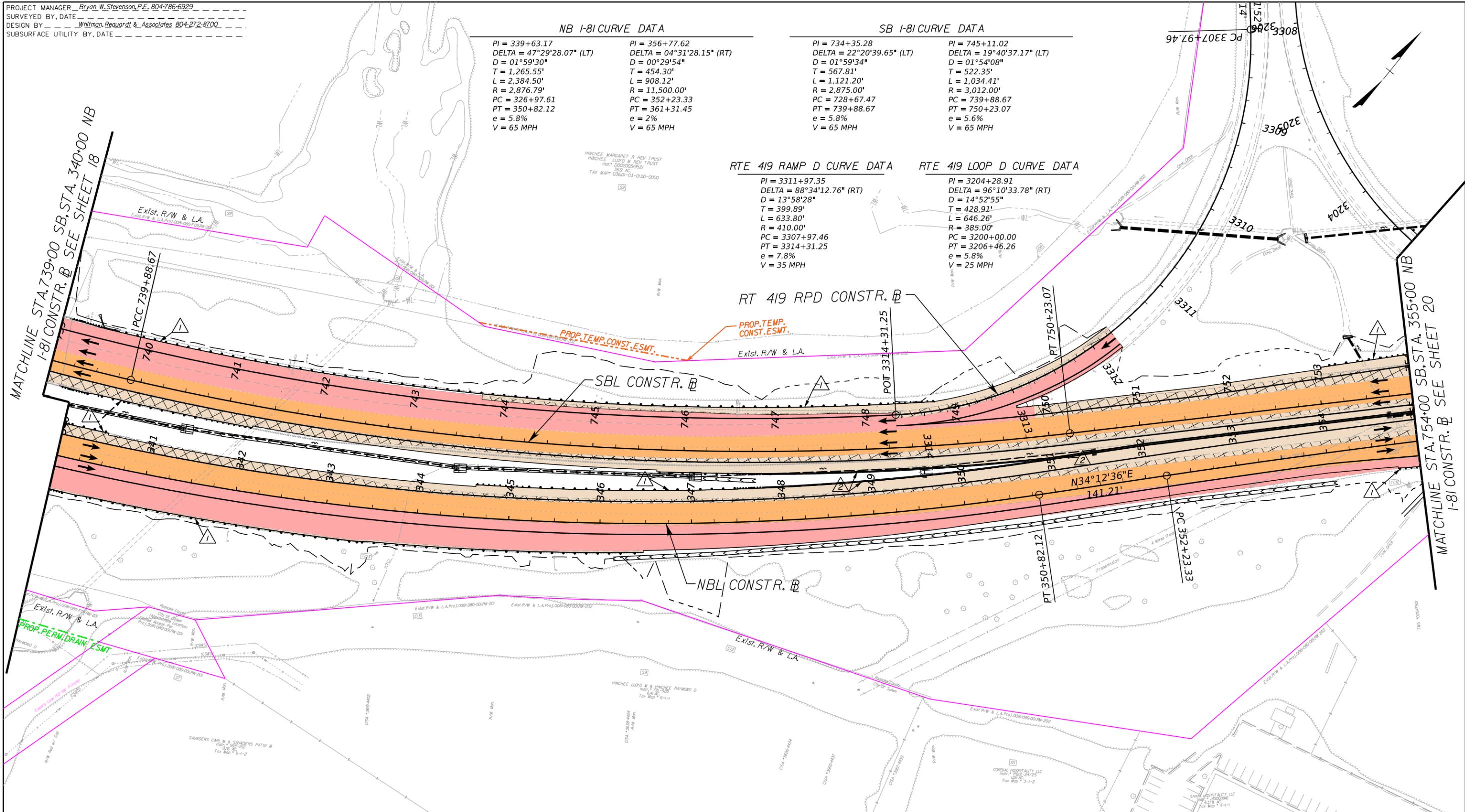
PI = 734+35.28	PI = 745+11.02
DELTA = 22°20'39.65" (LT)	DELTA = 19°40'37.17" (LT)
D = 01°59'34"	D = 01°54'08"
T = 567.81'	T = 522.35'
L = 1,121.20'	L = 1,034.41'
R = 2,875.00'	R = 3,012.00'
PC = 728+67.47	PC = 739+88.67
PT = 739+88.67	PT = 750+23.07
e = 5.8%	e = 5.6%
V = 65 MPH	V = 65 MPH

**RTE 419 RAMP D CURVE DATA**

PI = 3311+97.35
DELTA = 88°34'12.76" (RT)
D = 13°58'28"
T = 399.89'
L = 633.80'
R = 410.00'
PC = 3307+97.46
PT = 3314+31.25
e = 7.8%
V = 35 MPH

**RTE 419 LOOP D CURVE DATA**

PI = 3204+28.91
DELTA = 96°10'33.78" (RT)
D = 14°52'55"
T = 428.91'
L = 646.26'
R = 385.00'
PC = 3200+00.00
PT = 3206+46.26
e = 5.8%
V = 25 MPH



**LEGEND:**

EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE	2 INCH MIN. MILL AND OVERLAY	PROPOSED GUARDRAIL REQ'D	SFM
EXISTING EASEMENT	4 INCH MIN. MILL AND OVERLAY	PROPOSED CONCRETE BARRIER REQ'D	NATURAL GAS
PROPOSED LIMITED ACCESS LINE	6 INCH MIN. MILL AND OVERLAY	PROPOSED PIER PROTECTION BARRIER REQ'D	EXISTING WATER
PROPOSED RIGHT OF WAY	FULL DEPTH PAVEMENT	PROPOSED RETAINING WALL REQ'D	EXISTING ELECTRIC
PROPOSED TEMPORARY EASEMENT	PAVEMENT DEMOLITION	PROPOSED CURBING REQ'D	EXISTING FIBER OPTIC
PROPOSED PERMANENT EASEMENT	AREAS OF REDUCED ROW / EASEMENT IMPACTS	DENOTES CONSTRUCTION LIMITS IN CUT	EXISTING CABLE TV
PROPOSED UTILITY EASEMENT	POTENTIAL NOISE BARRIER	DENOTES CONSTRUCTION LIMITS IN FILL	EXISTING TELEPHONE
RFP PROPOSED LIMITED ACCESS LINE	PROPOSED FENCE		EXISTING TRAFFIC CONTROL
RFP PROPOSED TEMPORARY EASEMENT			EXISTING UNKNOWN UTILITY
RFP PROPOSED PERMANENT EASEMENT			
RFP PROPOSED RIGHT OF WAY			

**SCALE**

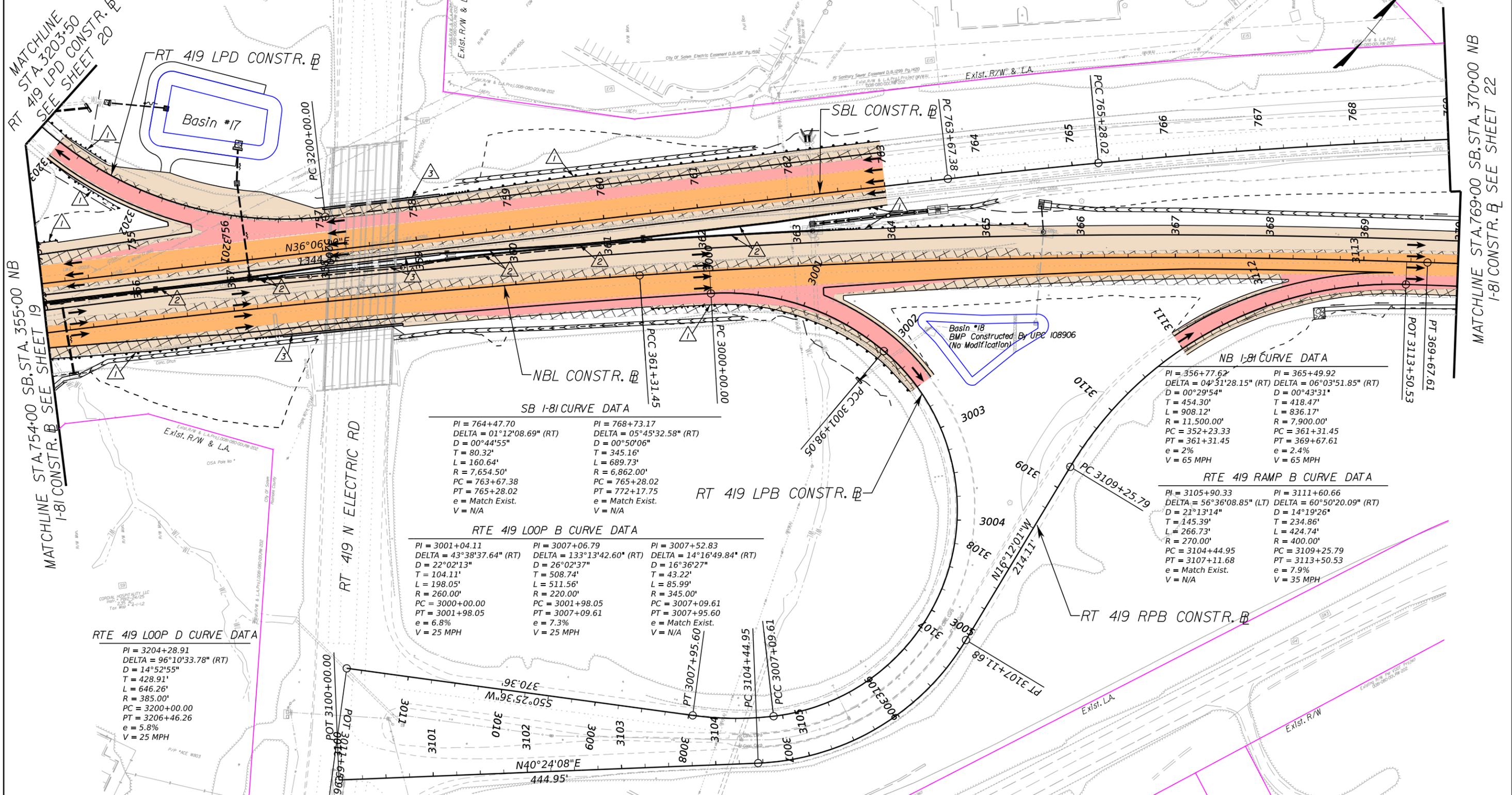
**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 19 OF 21

**BRANCH CIVIL** **ORDERS CONSTRUCTION COMPANY**

\$USER\$

\$DATE\$ \$FILE\$

PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_



MATCHLINE STA. 754+00 SB, STA. 355+00 NB  
I-81 CONSTR. B SEE SHEET 19

MATCHLINE STA. 769+00 SB, STA. 370+00 NB  
I-81 CONSTR. B SEE SHEET 22

**LEGEND:**

	EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE		2 INCH MIN. MILL AND OVERLAY		PROPOSED GUARDRAIL REQ'D		SFW
	EXISTING EASEMENT		4 INCH MIN. MILL AND OVERLAY		PROPOSED CONCRETE BARRIER REQ'D		NATURAL GAS
	PROPOSED LIMITED ACCESS LINE		6 INCH MIN. MILL AND OVERLAY		PROPOSED PIER PROTECTION BARRIER REQ'D		EXISTING WATER
	PROPOSED RIGHT OF WAY		FULL DEPTH PAVEMENT		PROPOSED RETAINING WALL REQ'D		EXISTING ELECTRIC
	PROPOSED TEMPORARY EASEMENT		PAVEMENT DEMOLITION		PROPOSED CURBING REQ'D		EXISTING FIBER OPTIC
	PROPOSED PERMANENT EASEMENT		AREAS OF REDUCED ROW / EASEMENT IMPACTS		DENOTES CONSTRUCTION LIMITS IN CUT		EXISTING CABLE TV
	PROPOSED UTILITY EASEMENT		POTENTIAL NOISE BARRIER		DENOTES CONSTRUCTION LIMITS IN FILL		EXISTING TELEPHONE
	RFP PROPOSED LIMITED ACCESS LINE		PROPOSED FENCE		PROPOSED WATER RELOCATION		EXISTING TRAFFIC CONTROL
	RFP PROPOSED TEMPORARY EASEMENT				PROPOSED SEWER RELOCATION		EXISTING UNKNOWN UTILITY
	RFP PROPOSED PERMANENT EASEMENT						
	RFP PROPOSED RIGHT OF WAY						

**SB I-81 CURVE DATA**

PI = 764+47.70 DELTA = 01°12'08.69" (RT) D = 00°44'55" T = 80.32' L = 160.64' R = 7,654.50' PC = 763+67.38 PT = 765+28.02 e = Match Exist. V = N/A	PI = 768+73.17 DELTA = 05°45'32.58" (RT) D = 00°50'06" T = 345.16' L = 689.73' R = 6,862.00' PC = 765+28.02 PT = 772+17.75 e = Match Exist. V = N/A
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**RTE 419 LOOP B CURVE DATA**

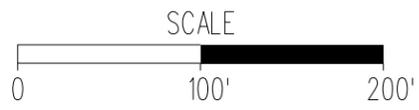
PI = 3001+04.11 DELTA = 43°38'37.64" (RT) D = 22°02'13" T = 104.11' L = 198.05' R = 260.00' PC = 3000+00.00 PT = 3001+98.05 e = 6.8% V = 25 MPH	PI = 3007+06.79 DELTA = 133°13'42.60" (RT) D = 26°02'37" T = 508.74' L = 511.56' R = 220.00' PC = 3001+98.05 PT = 3007+09.61 e = 7.3% V = 25 MPH	PI = 3007+52.83 DELTA = 14°16'49.84" (RT) D = 16°36'27" T = 43.22' L = 85.99' R = 345.00' PC = 3007+09.61 PT = 3007+95.60 e = Match Exist. V = N/A
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**NB I-81 CURVE DATA**

PI = 356+77.62 DELTA = 04°51'28.15" (RT) D = 00°29'54" T = 454.30' L = 908.12' R = 11,500.00' PC = 352+23.33 PT = 361+31.45 e = 2% V = 65 MPH	PI = 365+49.92 DELTA = 06°03'51.85" (RT) D = 00°43'31" T = 418.47' L = 836.17' R = 7,900.00' PC = 361+31.45 PT = 369+67.61 e = 2.4% V = 65 MPH
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**RTE 419 RAMP B CURVE DATA**

PI = 3105+90.33 DELTA = 56°36'08.85" (LT) D = 21°13'14" T = 145.39' L = 266.73' R = 270.00' PC = 3104+44.95 PT = 3107+11.68 e = Match Exist. V = N/A	PI = 3111+60.66 DELTA = 60°50'20.09" (RT) D = 14°19'26" T = 234.86' L = 424.74' R = 400.00' PC = 3109+25.79 PT = 3113+50.53 e = 7.9% V = 35 MPH
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TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 20 OF 21

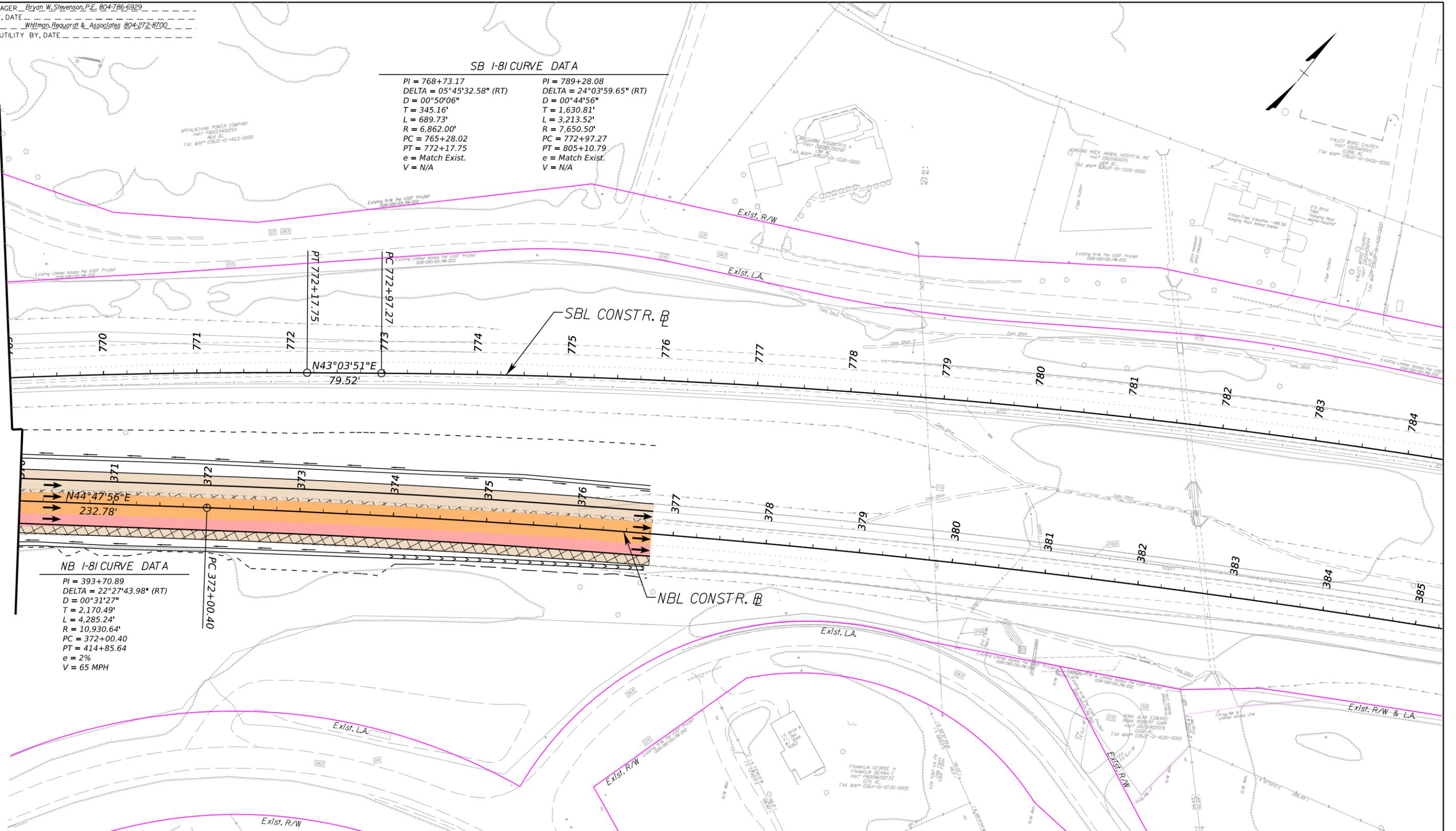


PROJECT MANAGER Bryan W. Stevenson, P.E. 804-786-6929  
 SURVEYED BY, DATE \_\_\_\_\_  
 DESIGN BY Whitman, Reardon & Associates 804-272-8700  
 SUBSURFACE UTILITY BY, DATE \_\_\_\_\_

**SB I-81 CURVE DATA**

PI = 768+73.17	PI = 789+28.08
DELTA = 05°45'32.58" (RT)	DELTA = 24°03'59.65" (RT)
D = 00°50'06"	D = 00°44'56"
T = 345.16'	T = 1,630.81'
L = 689.73'	L = 3,213.52'
R = 6,862.00'	R = 7,650.50'
PC = 765+28.02	PC = 772+97.27
PT = 772+17.75	PT = 805+10.79
e = Match Exist.	e = Match Exist.
V = N/A	V = N/A

MATCHLINE STA. 769+00 SB, STA. 370+00 NB  
I-81 CONSTR. & SEE SHEET 20

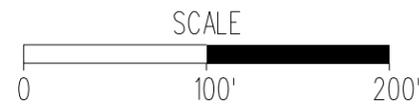


**NB I-81 CURVE DATA**

PI = 393+70.89
DELTA = 22°27'43.98" (RT)
D = 00°31'27"
T = 2,170.49'
L = 4,285.24'
R = 10,930.64'
PC = 372+00.40
PT = 414+85.64
e = 2%
V = 65 MPH

**LEGEND:**

- |   |   |  |                          |
|---|---|--|--------------------------|
| EXISTING RIGHT OF WAY AND/OR EXISTING LIMITED ACCESS LINE | 2 INCH MIN. MILL AND OVERLAY            | PROPOSED GUARDRAIL REQ'D               | SFW                      |
| EXISTING EASEMENT   | 4 INCH MIN. MILL AND OVERLAY            | PROPOSED CONCRETE BARRIER REQ'D        | NATURAL GAS              |
| PROPOSED LIMITED ACCESS LINE                              | 6 INCH MIN. MILL AND OVERLAY            | PROPOSED PIER PROTECTION BARRIER REQ'D | EXISTING WATER           |
| PROPOSED RIGHT OF WAY                                     | FULL DEPTH PAVEMENT                     | PROPOSED RETAINING WALL REQ'D          | EXISTING ELECTRIC        |
| PROPOSED TEMPORARY EASEMENT                               | PAVEMENT DEMOLITION                     | PROPOSED CURBING REQ'D                 | EXISTING FIBER OPTIC     |
| PROPOSED PERMANENT EASEMENT                               | AREAS OF REDUCED ROW / EASEMENT IMPACTS | DENOTES CONSTRUCTION LIMITS IN CUT     | EXISTING CABLE TV        |
| PROPOSED UTILITY EASEMENT                                 | POTENTIAL NOISE BARRIER                 | DENOTES CONSTRUCTION LIMITS IN FILL    | EXISTING TELEPHONE       |
| RFP PROPOSED LIMITED ACCESS LINE                          | PROPOSED FENCE                          | PROPOSED WATER RELOCATION              | EXISTING TRAFFIC CONTROL |
| RFP PROPOSED TEMPORARY EASEMENT                           |   | PROPOSED SEWER RELOCATION              | EXISTING UNKNOWN UTILITY |
| RFP PROPOSED PERMANENT EASEMENT                           |   |  |                          |
| RFP PROPOSED RIGHT OF WAY                                 |   |  |                          |

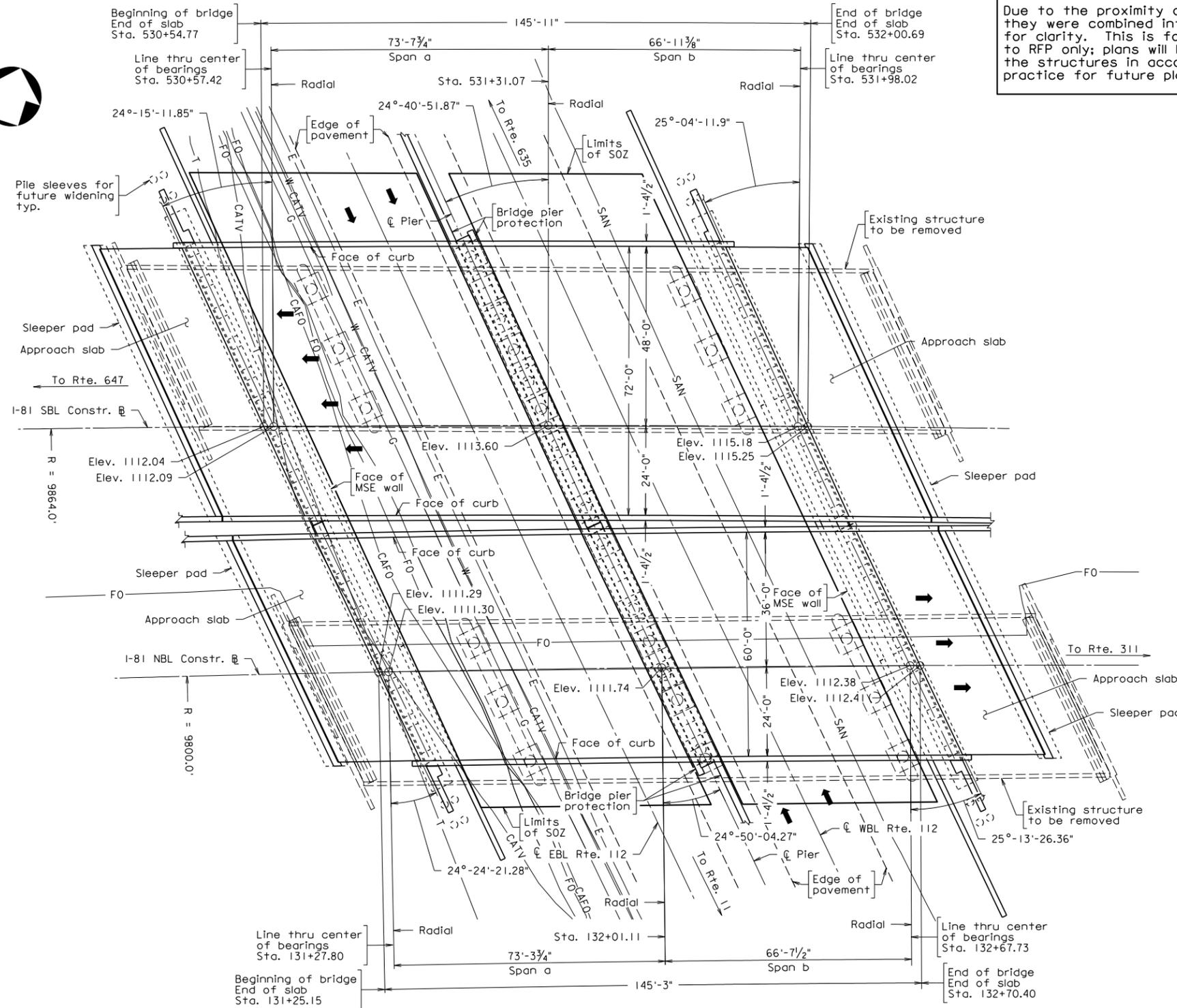


**TECHNICAL PROPOSAL CONCEPTUAL DESIGN**

I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)  
 SHEET 21 OF 21



## B. STRUCTURE DESIGN



Due to the proximity of the bridges, they were combined into a single plan for clarity. This is for the Response to RFP only; plans will be developed for the structures in accordance with VDOT practice for future plan submittals.

STATE	FEDERAL AID	STATE	SHEET NO.
VA.	PROJECT	ROUTE PROJECT	81 0081-080-946, B683, B688 1
Federal Structure No.		FHWA Construction and Scour Code:	
Federal Stewardship and Oversight Code:			UPC No.

**DESIGN EXCEPTION(S):**

**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 (NBL Str. No. B683).  
72'-0" face-to-face of curbs (SBL Str. No. B688).

Span layout: 73'-4" - 66'-8" (NBL Str. No. B683).  
73'-8" - 67'-0" (SBL Str. No. B688).

Capacity: HL-93 loading.

Specifications:

- Construction: Virginia Department of Transportation Road and Bridge Specifications, 2020.
- Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; including Errata and VDOT Modifications.
- Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

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

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

Design loading includes 15 psf allowance for future wearing surface.

All structural steel shall be ASTM A709 Grade 50W and shall be unpainted.

Concrete in superstructure, barriers and integral backwalls shall be Low Shrinkage Class A4 Modified in accordance with Section 217.12(a); in substructure, Class A3.

Concrete surface color coating shall be grey, similar to Federal Standard Color No. 595-36622 and shall be required at all locations of architectural treatment.

All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for steels noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications. All reinforcing bar dimensions on the detailed drawings are to centers of bars except where otherwise noted and are subject to fabrication and construction tolerances.

CRR steels shall conform to one or more of the three Classes listed in Section 223 of the Specifications. The Class(es) of CRR steel(s) required on this project is/are noted on plan sheets and in the reinforcing steel schedule. CRR Steel, Class II or Class III may be substituted for Class I. CRR Steel, Class III, may be substituted for Class II.

Bridge No. of existing NBL Str. No. B683 bridge is 2004. Plan No. is 151-03 (NBL Str. No. B683). Bridge No. of existing SBL Str. B688 bridge is 2005. Plan No. is 151-03 (SBL Str. No. B688).

Drystack architectural treatment shall be placed on exterior faces of parapets, abutments and MSE walls.

ABUTMENT A PLAN ABUTMENT B  
Lighting not shown.



**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

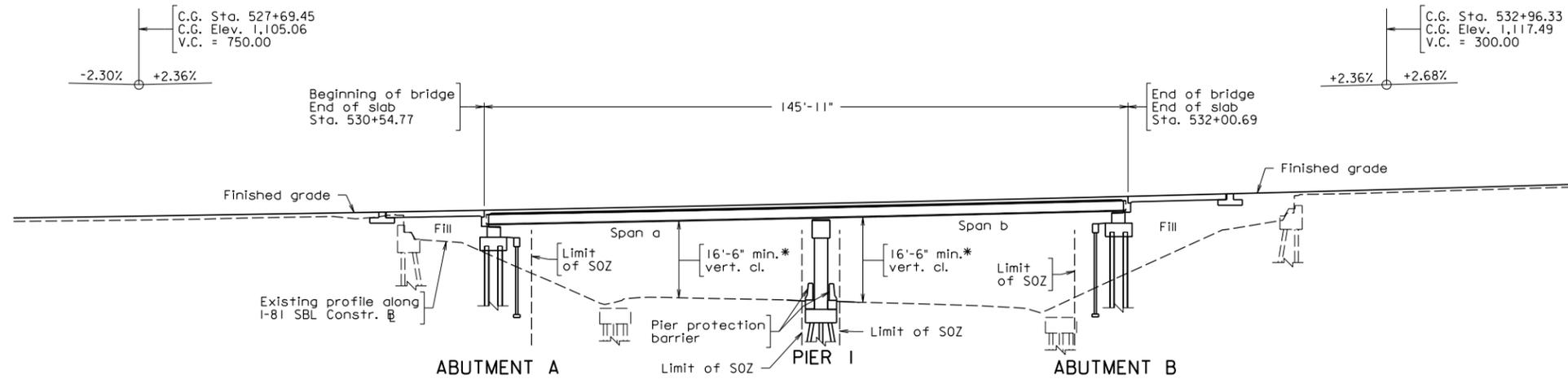
Approved: \_\_\_\_\_ Date \_\_\_\_\_  
District Administrator

Date: March 3, 2021

151-03C  
© 2021, Commonwealth of Virginia Sheet 1 of 5

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

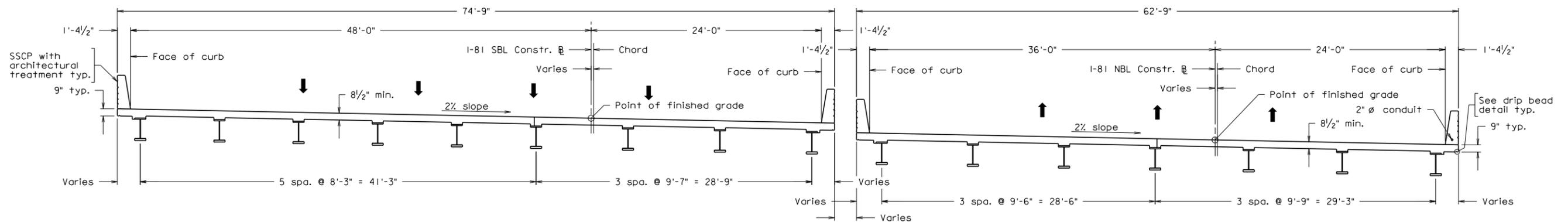
STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-080-946, B683, B688	2



**DEVELOPED SECTION ALONG I-81 CONSTR. B**

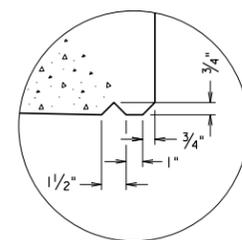
SBL shown, NBL similar.

\*16'-6" minimum vertical clearance will be exceeded in proposed to provide minimum 16'-6" vertical clearance for future widening.



**TRANSVERSE SECTION**

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



**DRIP DETAIL**

Not to scale

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

**PRELIMINARY PLANS**

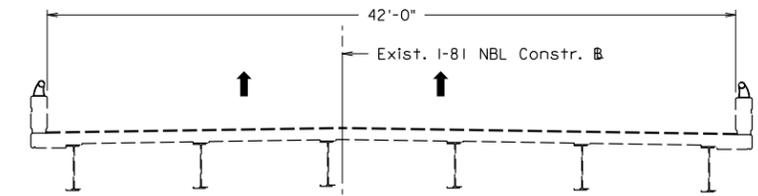
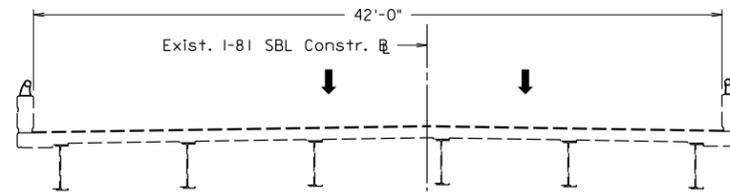
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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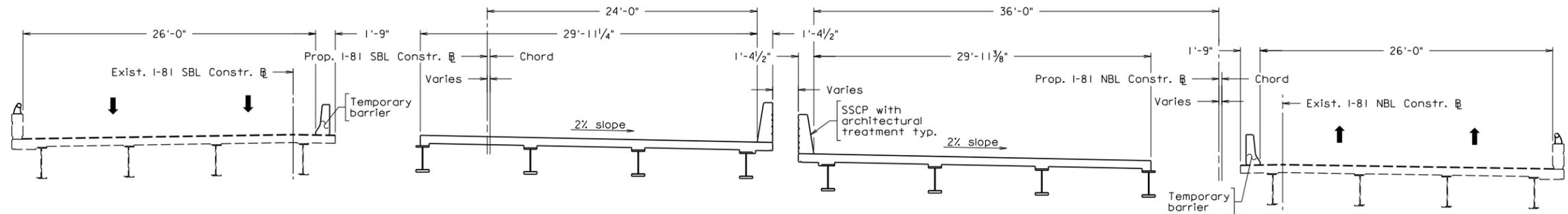
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
I-81 OVER RTE. 112				
DEVELOPED SECTION AND TRANSVERSE SECTION				
No.	Description	Date	Designed: .....	Date
			Drawn: .....	Plan No.
			Checked: .....	Sheet No.
Revisions			Mar. 2021	151-03C
				2 of 5



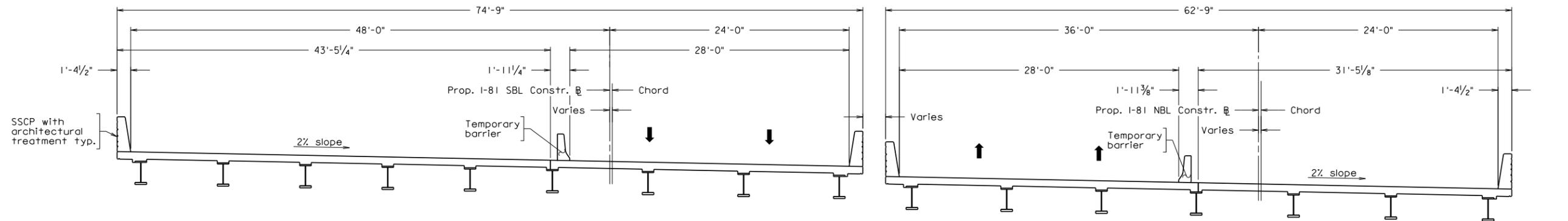
STATE	FEDERAL AID		STATE		SHEET NO.
VA.	ROUTE	PROJECT	ROUTE	PROJECT	
			81	0081-080-946, B683, B688	3



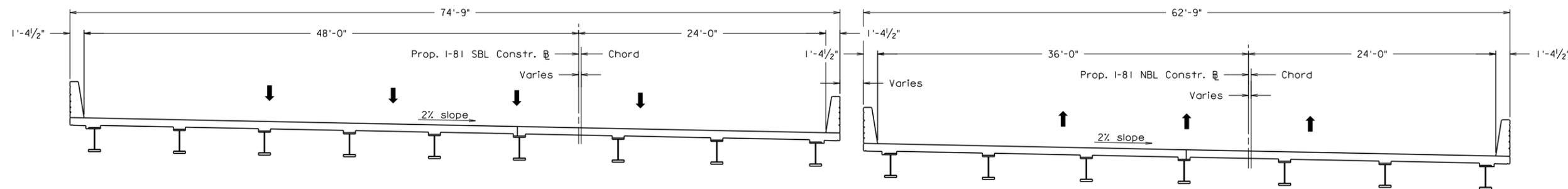
EXISTING



PHASE 2



PHASE 3



FINAL



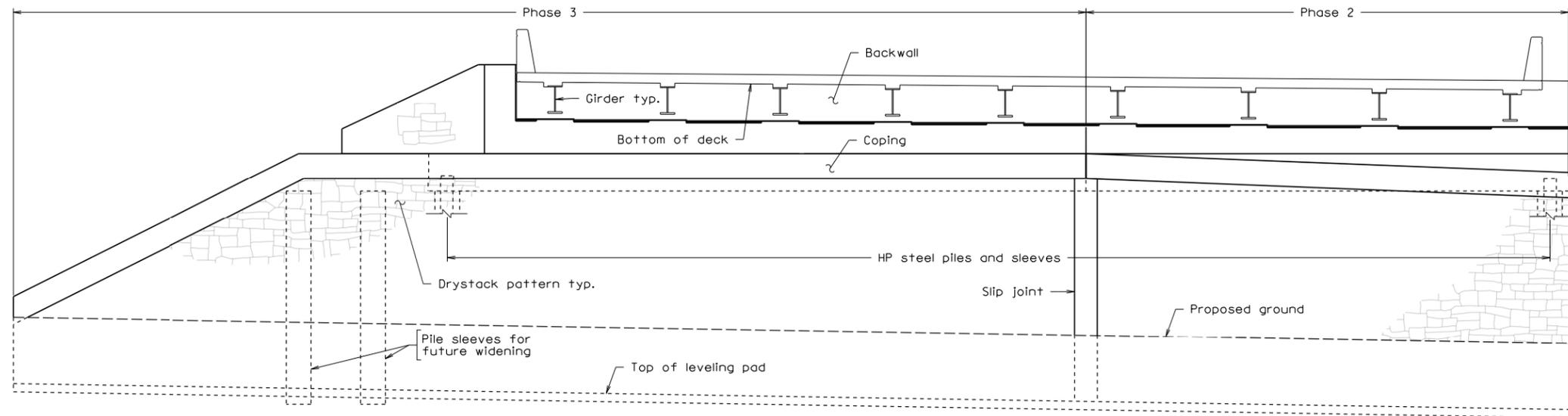
Scale: 3/16" = 1'-0"

PRELIMINARY PLANS  
THESE PLANS NOT TO BE USED  
FOR CONSTRUCTION

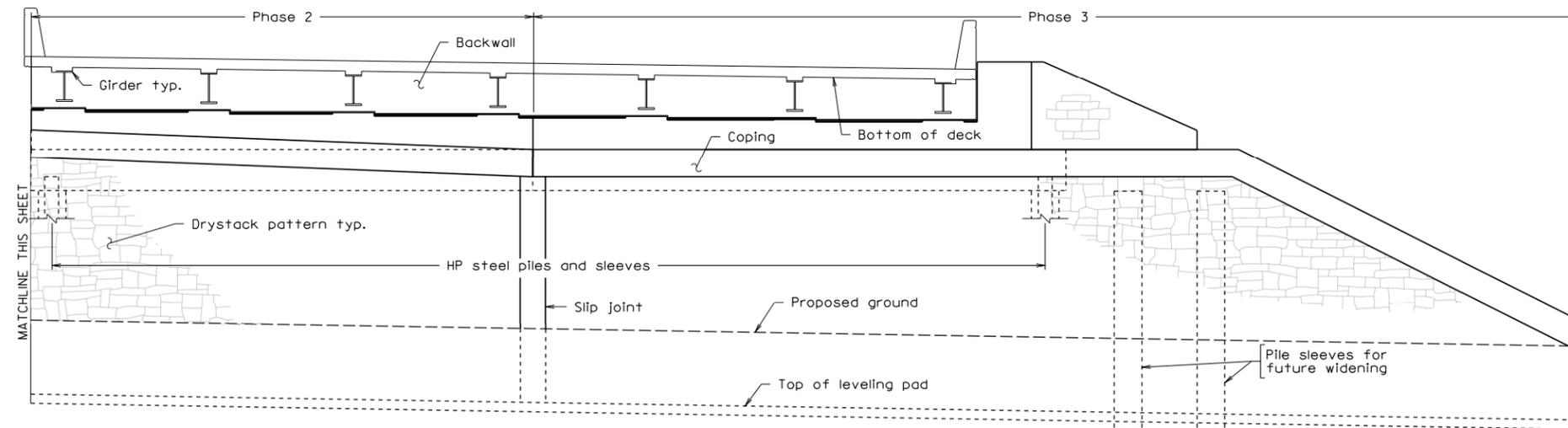
© 2021, Commonwealth of Virginia

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
I-81 OVER RTE. 112			
SEQUENCE OF CONSTRUCTION			
No.	Description	Date	Revisions
Designed: .....	Date	Plan No.	Sheet No.
Drawn: .....	Mar. 2021	151-03C	3 of 5
Checked: .....			

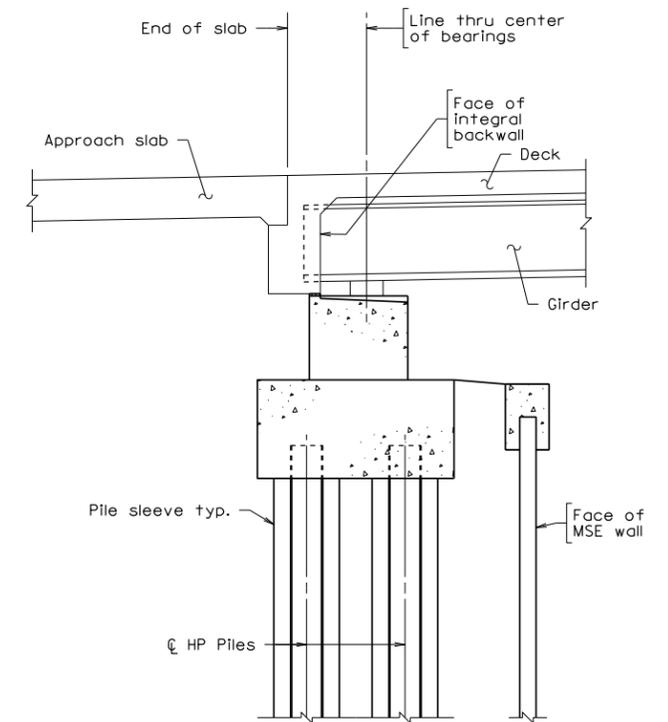
STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-080-946, B683, B688	4



**SBL ELEVATION**  
Abutment B shown. Abutment A similar opposite hand.



**NBL ELEVATION**  
Abutment B shown. Abutment A similar opposite hand.



**TYPICAL SECTION**  
Scale: 3/8" = 1'-0"

Notes:  
HR-1 railing as required by RFP not shown.  
Only part architectural treatment shown for clarity.

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

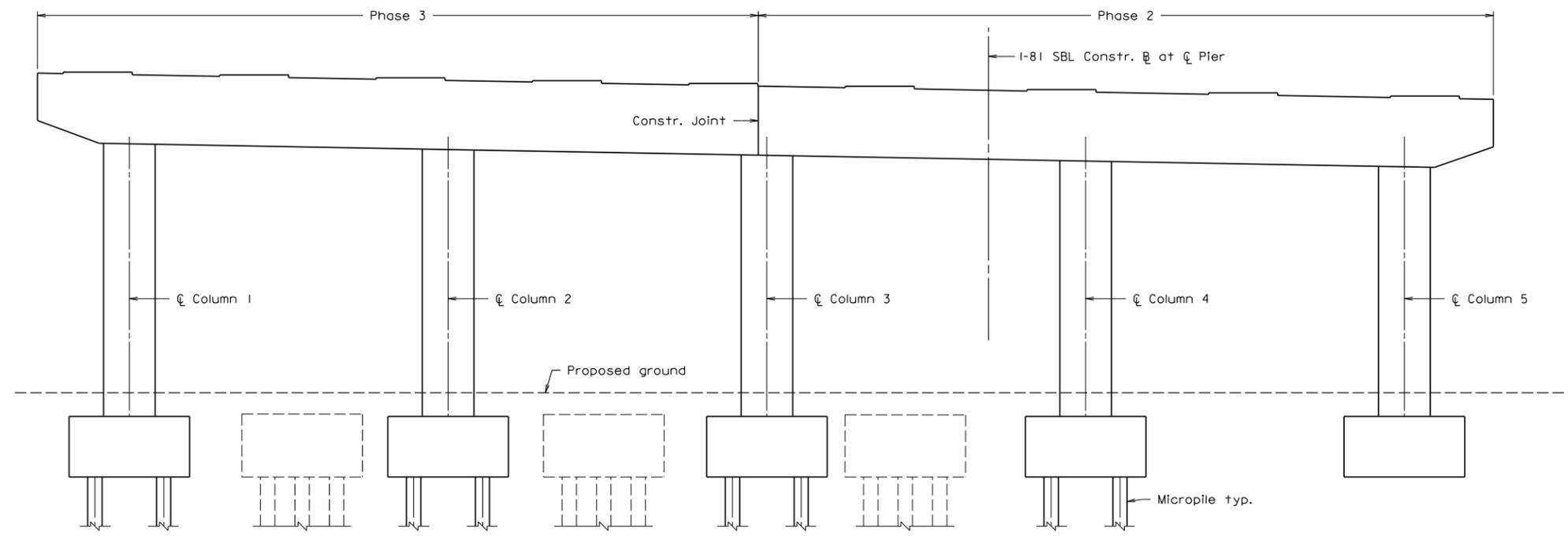
Scale: 3/8" = 1'-0" unless otherwise noted.

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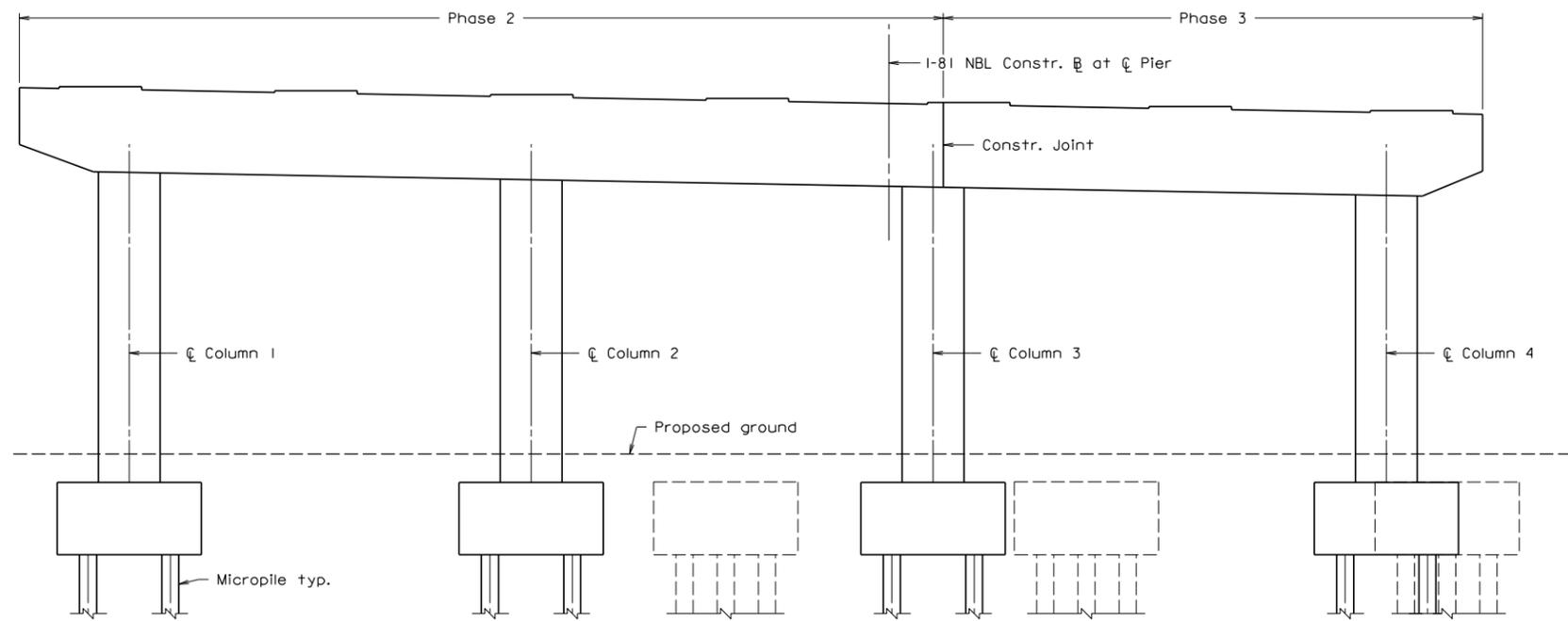


COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
I-81 OVER RTE. 112				
ABUTMENT AND MSE WALL ELEVATIONS				
No.	Description	Date	Designed: .....	Date
			Drawn: .....	Plan No.
			Checked: .....	Sheet No.
Revisions			Mar. 2021	151-03C 4 of 5

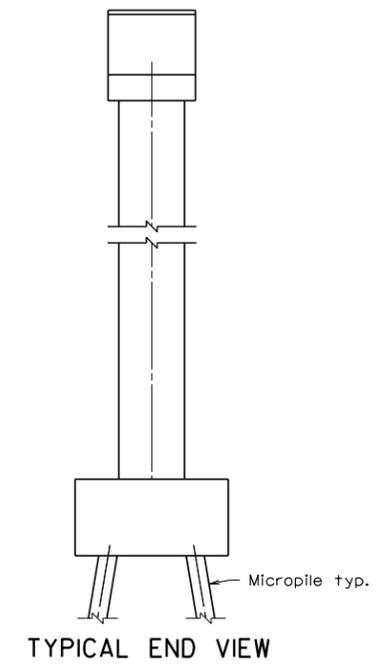
STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-080-946, B683, B688	5



SBL PIER ELEVATION



NBL PIER ELEVATION



TYPICAL END VIEW



Scale: 1/4" = 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				
I-81 OVER RTE. 112				
PIER ELEVATIONS AND TYPICAL END VIEW				
No.	Description	Date	Designed: .....	Date
			Drawn: .....	Plan No.
			Checked: .....	Sheet No.
Revisions			Mar. 2021	151-03C 5 of 5

STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	NO.
VA.		81	0081-080-946, B684, B685
Federal Structure No.		FHWA Construction and Scour Code:	
Federal Stewardship and Oversight Code:		UPC No.	

Due to proximity of the bridges, they were combined into a single plan for clarity. This is for the Response to RFP only; plans will be developed for the structures in accordance with VDOT practice for the future plan submittals.

**DESIGN EXCEPTION(S):**

**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. (NBL Str. No. B684)  
60'-0" face-to-face of curbs. (SBL Str. No. B685)

Span layout: 81'-6" (NBL Str. No. B684)  
83'-5 7/8", Varies (SBL Str. No. B685)

Capacity: HL-93 loading.

Specifications:

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

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

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

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

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

Design loading includes 15 psf allowance for future wearing surface.

All structural steel shall be ASTM A709 Grade 50W and shall be unpainted.

Concrete in superstructure, parapets, and integral backwalls shall be Low Shrinkage Class A4 Modified in accordance with Section 217.12(a); in substructure, Class A3.

Concrete surface color coating shall be grey, similar to Federal Standard Color No. 595-36622 and shall be required at all locations of architectural treatment.

All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for steels noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications. All reinforcing bar dimensions on the detailed drawings are to centers of bars except where otherwise noted and are subject to fabrication and construction tolerances.

CRR steels shall conform to one or more of the three Classes listed in Section 223 of the Specifications. The Classes of CRR steels required on this project are noted on plan sheets and in the reinforcing steel schedule. CRR Steel, Class II or Class III may be substituted for Class I. CRR Steel, Class III, may be substituted for Class II.

Bridge No. of existing I-81 NB structure is 2010 and Plan No. is 151-10. Bridge No. of existing I-81 SB structure is 2011 and Plan No. is 151-10.

Drystack architectural treatment shall be placed on exterior faces of parapets, abutments, and MSE walls.

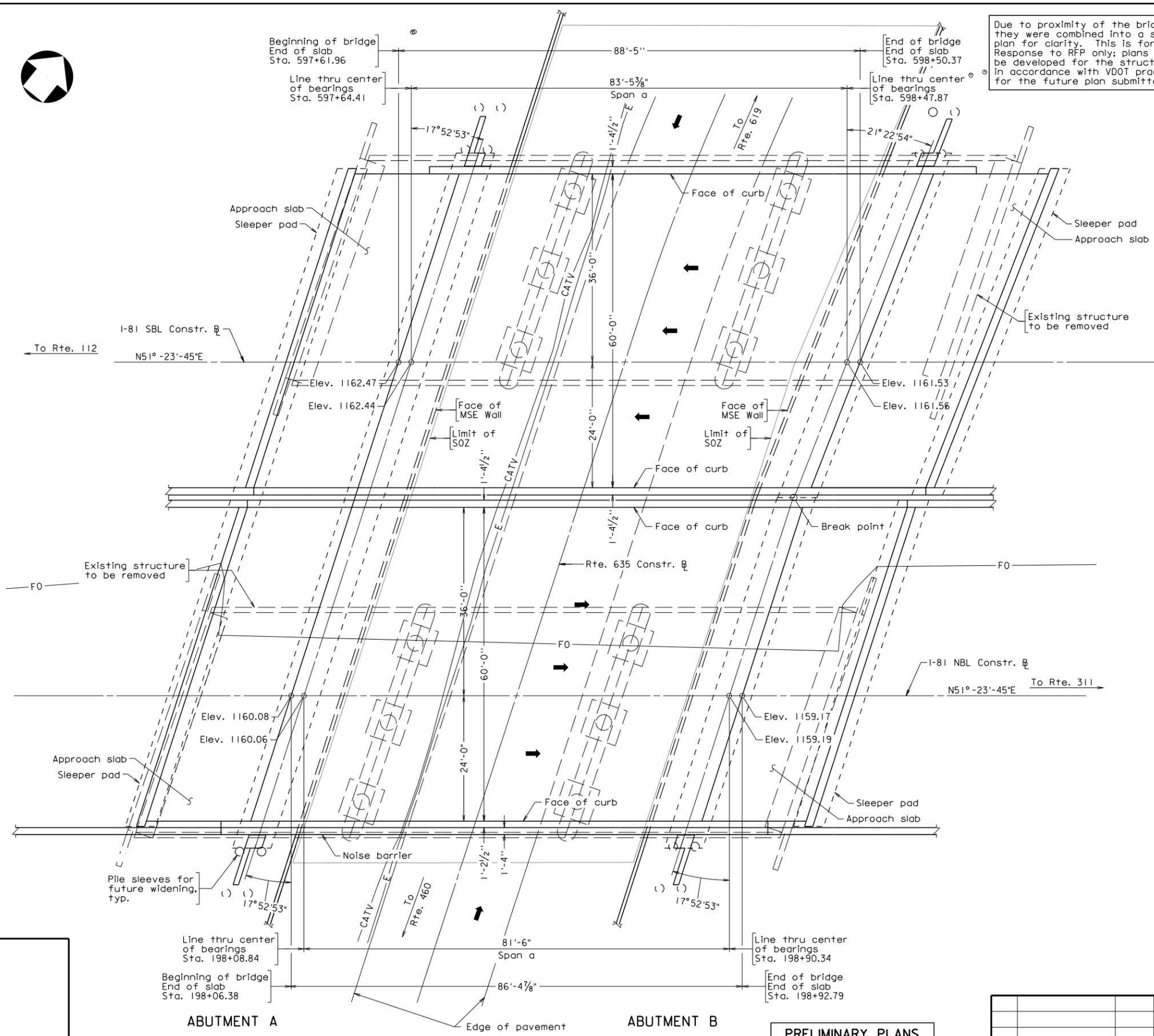


**COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION  
PROPOSED BRIDGE REPLACEMENT ON**

**I-81 NBL OVER ROUTE 635 (GOODWIN AVE.)  
ROANOKE CO. - 1.26 MI. N OF ROUTE 112  
PROJ. 0081-080-946, B684  
I-81 SBL OVER ROUTE 635 (GOODWIN AVE.)  
ROANOKE CO. - 3.03 MI. S OF ROUTE 419  
PROJ. 0081-080-946, B685**

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

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



PLAN

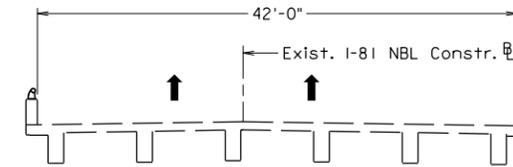
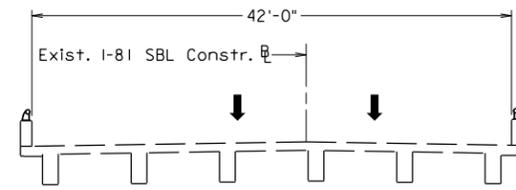
**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

Scale: 1" = 10'

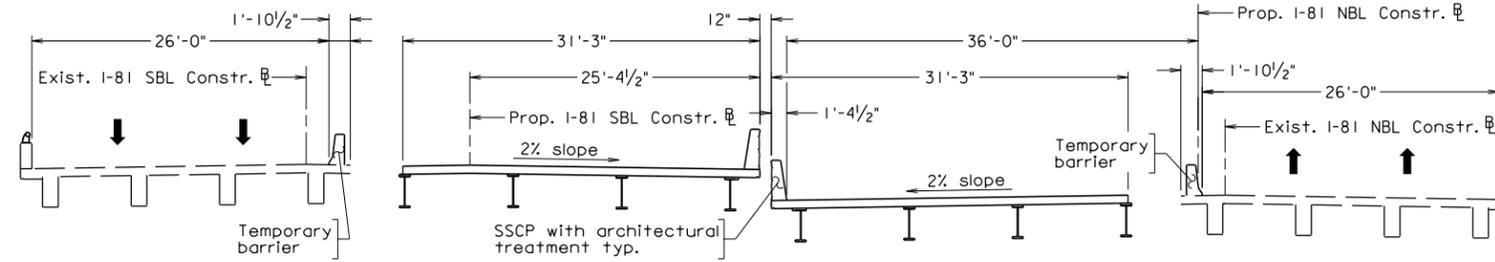
No.	Description	Date
REVISIONS		
For Table of Revisions, see Sheet 2.		



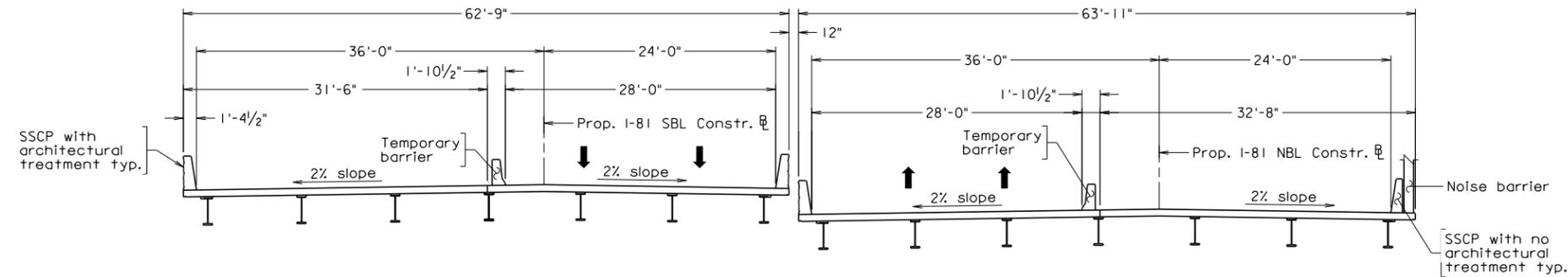
STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.		81	0081-080-946, B684, B685
			3



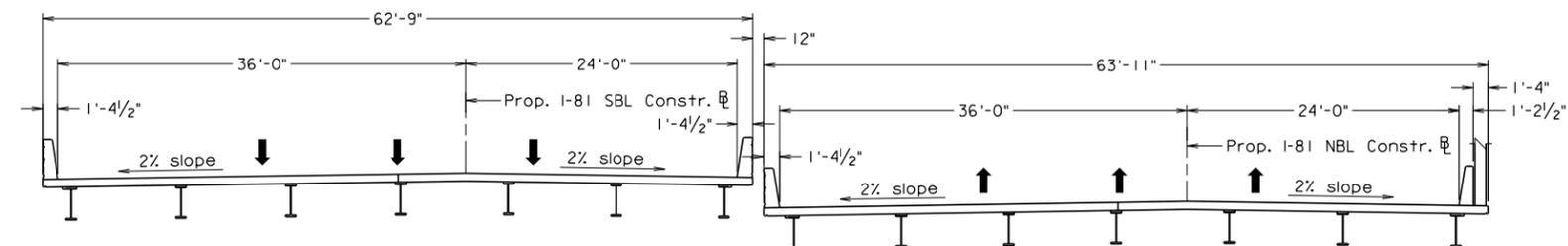
EXISTING



PHASE 2



PHASE 3



FINAL

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

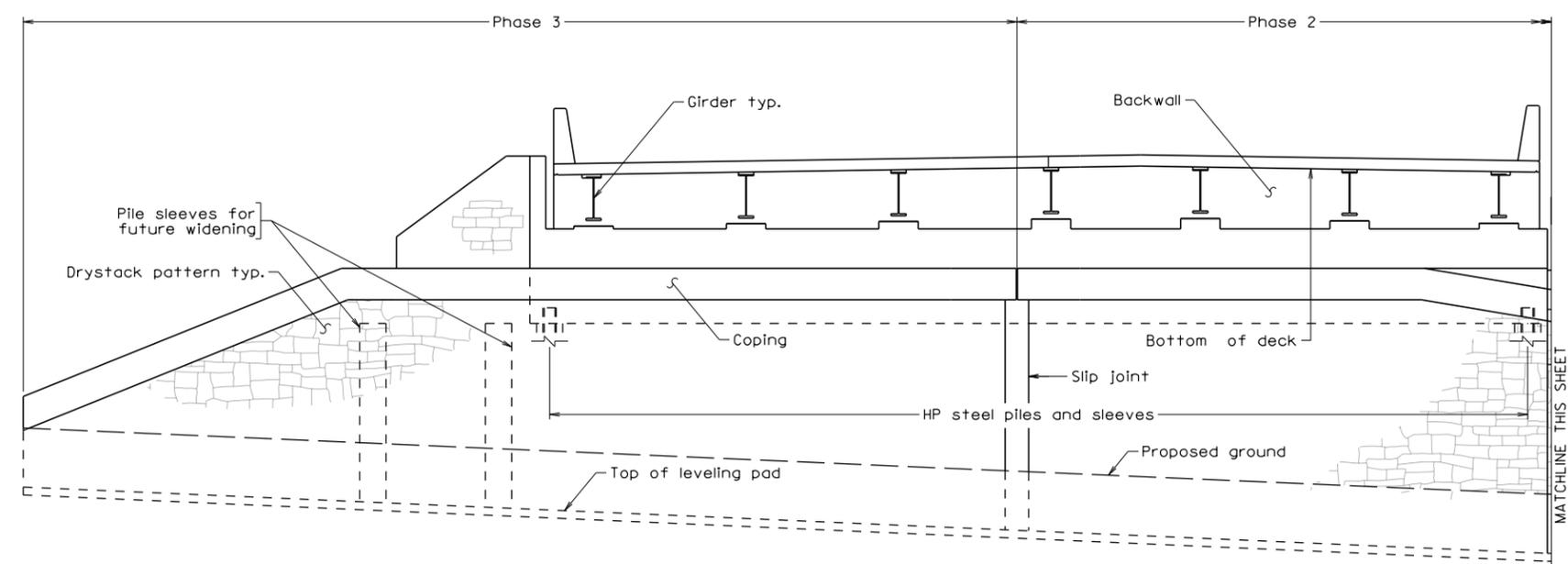


Scale: 1/8" = 1'-0"

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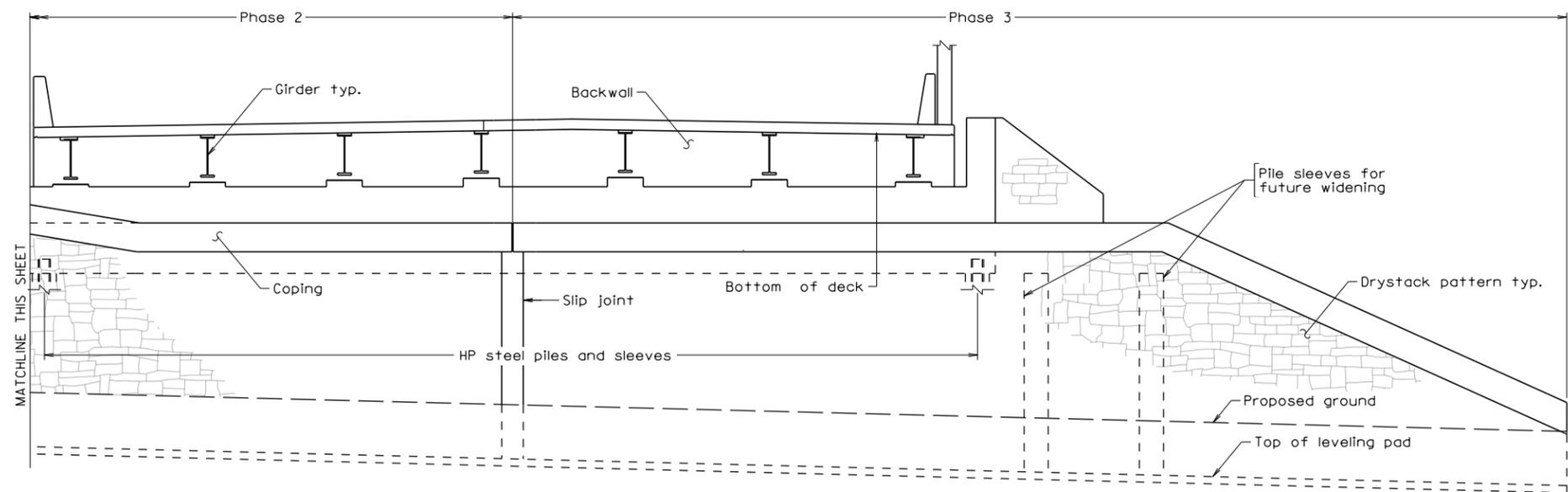
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
I-81 OVER RTE 635			
SEQUENCE OF CONSTRUCTION 83			
No.	Description	Date	Designed: .....
			Drawn: .....
			Checked: .....
			Date
			Plan No.
			Sheet No.
			3 of 4

STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.		81	0081-080-946, B684, B685



**SBL ELEVATION**

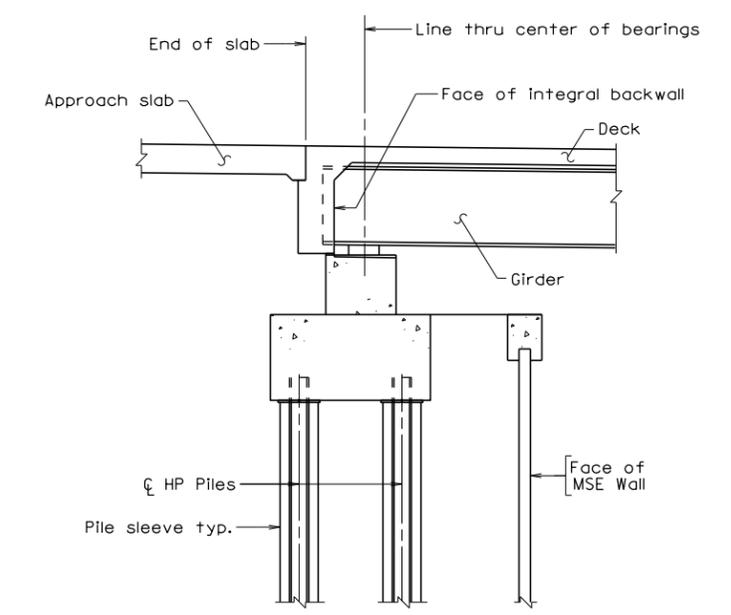
Abutment B shown, Abutment A similar opposite hand.



**NBL ELEVATION**

Abutment B shown, Abutment A similar opposite hand.

Notes:  
 HR-I railing as required by RFP not shown.  
 Only part of the architectural treatment is shown for clarity.



**TYPICAL SECTION**

Scale: 1/4" = 1'-0"



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

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

© 2021, Commonwealth of Virginia

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION					
STRUCTURE AND BRIDGE DIVISION					
I-81 OVER RTE 635					
ABUTMENT AND MSE WALL ELEVATIONS 84					
No.	Description	Date	Designed: .....	Date	Plan No.
			Drawn: .....	Mar. 2021	Sheet No.
			Checked: .....		4 of 4
Revisions					

STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT	ROUTE	PROJECT	NO.	
VA.		81	0081-080-946, B686, B687	1	
Federal Structure No.			FHWA Construction and Scour Code:		
Federal Stewardship and Oversight Code:				UPC No.	

**DESIGN EXCEPTION(S):**

**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. (NBL Str. No. B687)  
60'-0" face-to-face of curbs. (SBL Str. No. B686)

Span layout: 70'-2 1/2" (NBL Str. No. B687)  
70'-2 1/2" (SBL Str. No. B686)

Capacity: HL-93 loading.

Specifications:

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

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

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

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

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

Design loading includes 15 psf allowance for future wearing surface.

All structural steel shall be ASTM A709 Grade 50W and shall be unpainted.

Concrete in superstructure, barriers, and integral backwalls shall be Low Shrinkage Class A4 Modified in accordance with Section 217.12(a); in substructure, Class A3.

Concrete surface color coating shall be grey, similar to Federal Standard Color No. 595-36622 and shall be required at all locations of architectural treatment.

All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for steels noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications. All reinforcing bar dimensions on the detailed drawings are to centers of bars except where otherwise noted and are subject to fabrication and construction tolerances.

CRR steels shall conform to one or more of the three Classes listed in Section 223 of the Specifications. The Classes of CRR steels required on this project are noted on plan sheets and in the reinforcing steel schedule. CRR Steel, Class II or Class III may be substituted for Class I. CRR Steel, Class III, may be substituted for Class II.

Bridge No. of existing I-81 NB structure is 2008 and Plan No. is 151-04. Bridge No. of existing I-81 SB structure is 2011 and Plan No. is 151-04.

Drystack architectural treatment shall be placed on exterior faces of parapets, abutments, and MSE walls.



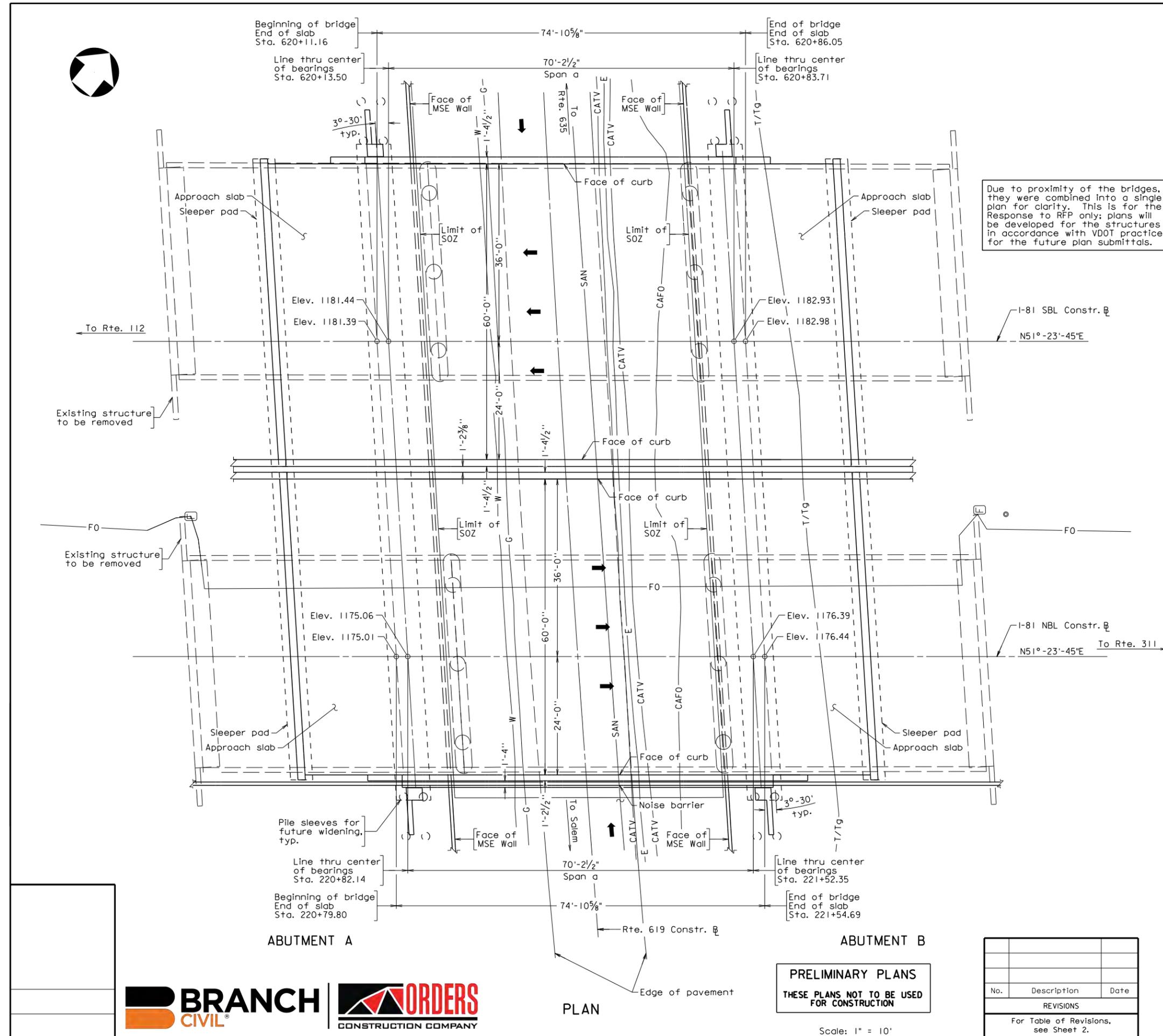
**COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION  
PROPOSED BRIDGE REPLACEMENT ON**

**I-81 NBL OVER ROUTE 619 (WILDWOOD RD)  
ROANOKE CO. - 1.65 MI. N. OF ROUTE 112  
PROJ. 0081-080-946, B687  
I-81 SBL OVER ROUTE 619 (WILDWOOD RD)  
ROANOKE CO. - 1.23 MI. S. OF ROUTE 311  
PROJ. 0081-080-946, B686**

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

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

Date: March 3, 2021 © 2021, Commonwealth of Virginia Sheet 1 of 4



Due to proximity of the bridges, they were combined into a single plan for clarity. This is for the Response to RFP only; plans will be developed for the structures in accordance with VDOT practice for the future plan submittals.

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

Scale: 1" = 10'

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

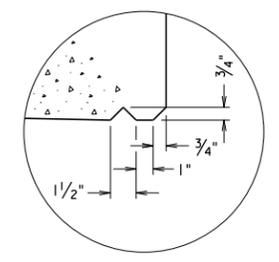
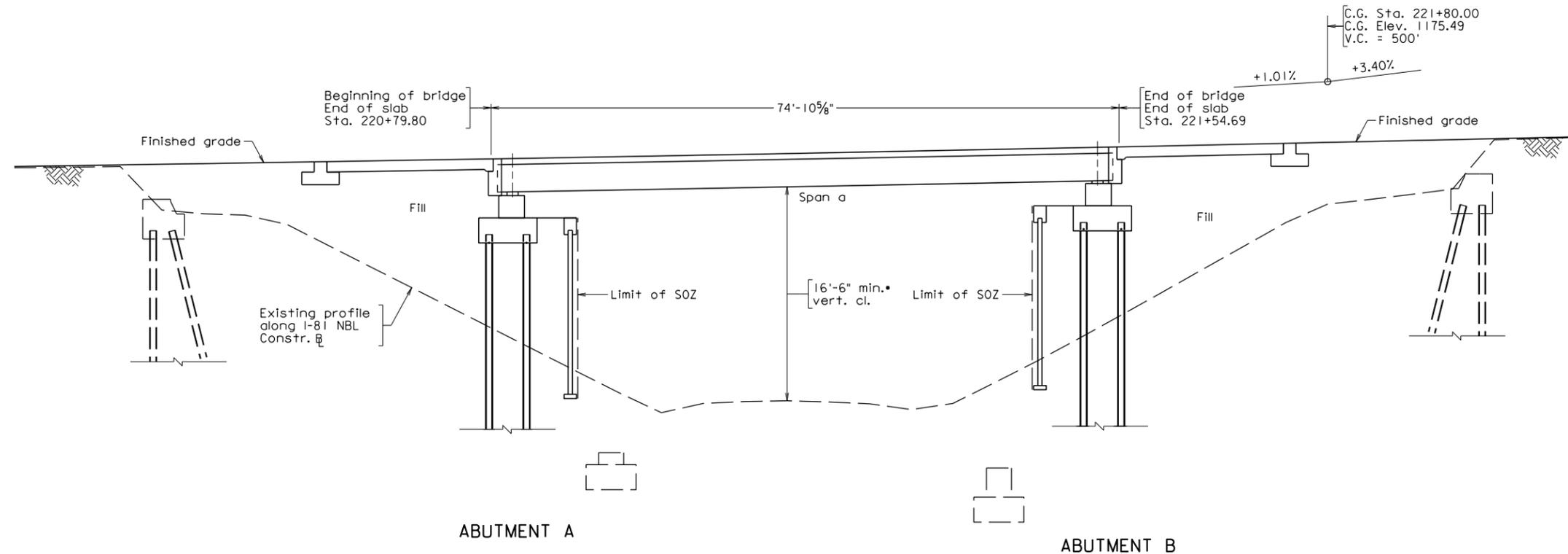


ABUTMENT A

ABUTMENT B

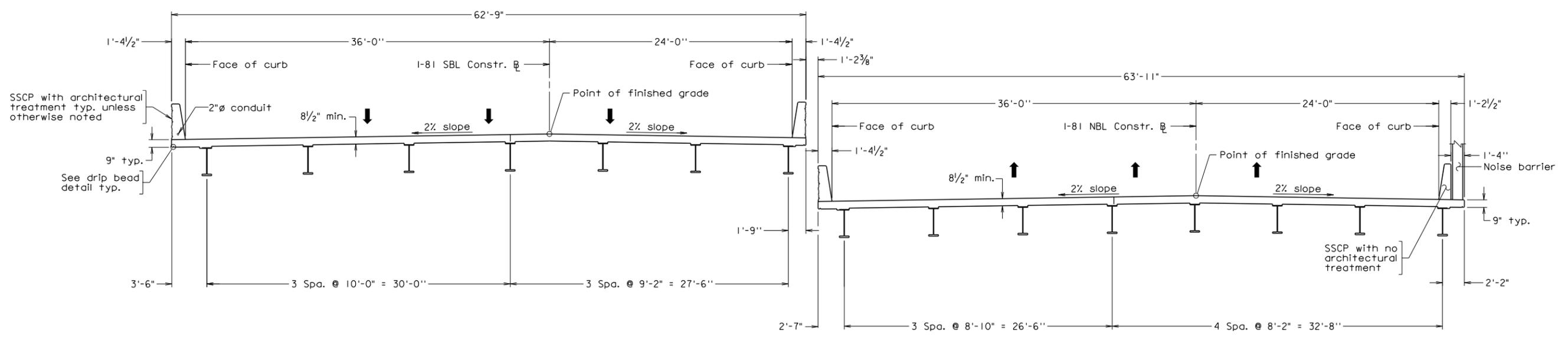
PLAN

STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.		81	0081-080-946, B686, B687
			2



**DRIP DETAIL**  
Not to scale

**DEVELOPED SECTION ALONG I-81 CONSTR. B**  
NBL shown, SBL similar.  
\*16'-6" minimum vertical clearance will be exceeded in proposed to provide minimum 16'-6" vertical clearance for future widening.



**TRANSVERSE SECTION**  
Scale: 3/16" = 1'-0"

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

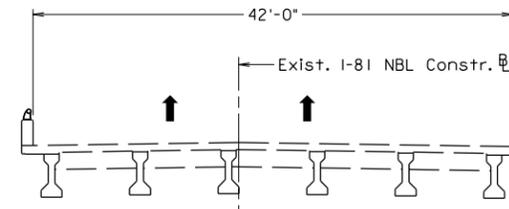
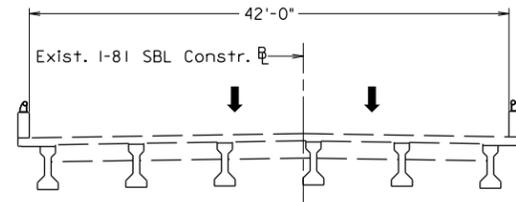
Scale: 1/8" = 1'-0" unless otherwise noted

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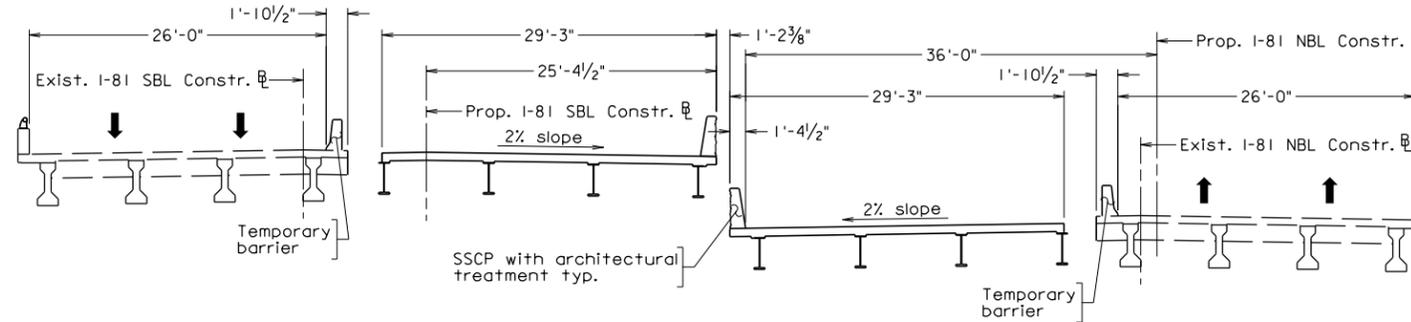


COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
I-81 OVER RTE 619			
DEVELOPED SECTION AND TRANSVERSE SECTION 86			
No.	Description	Date	Designed: .....
			Drawn: .....
			Checked: .....
			Date
			Plan No.
			Sheet No.
			2 of 4

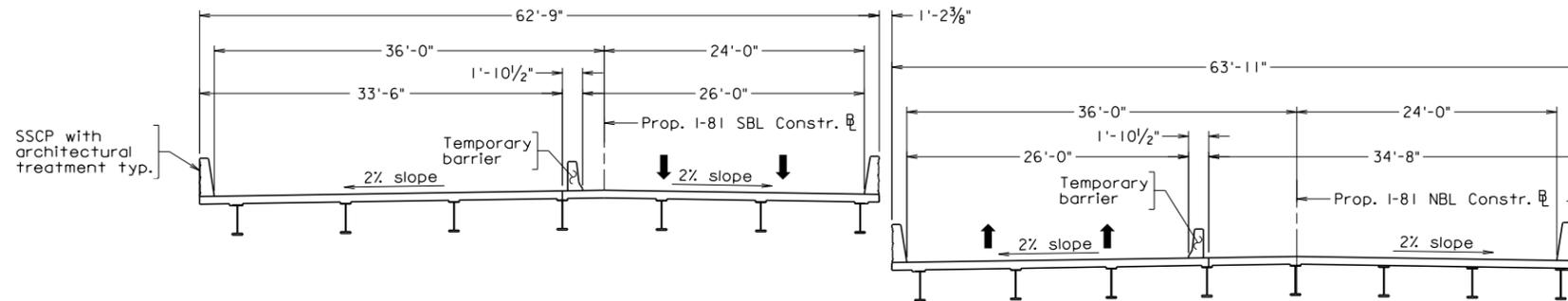
STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.		81	0081-080-946, B686, B687
			3



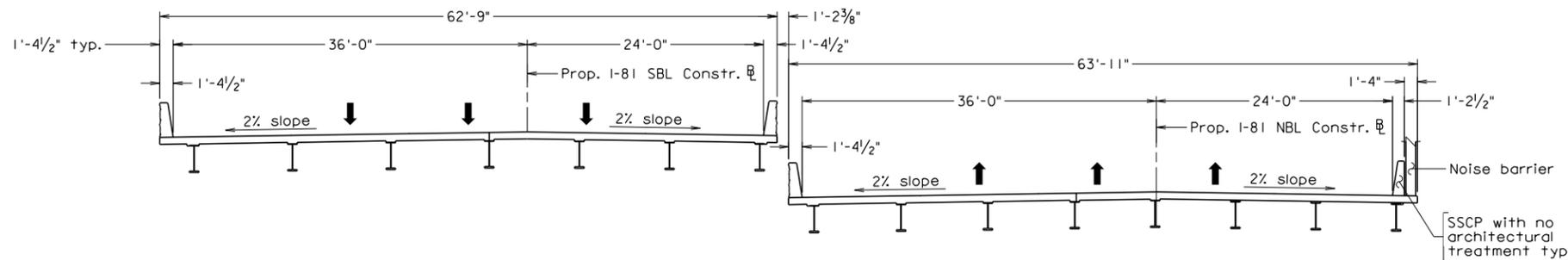
EXISTING



PHASE 2



PHASE 3



FINAL

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

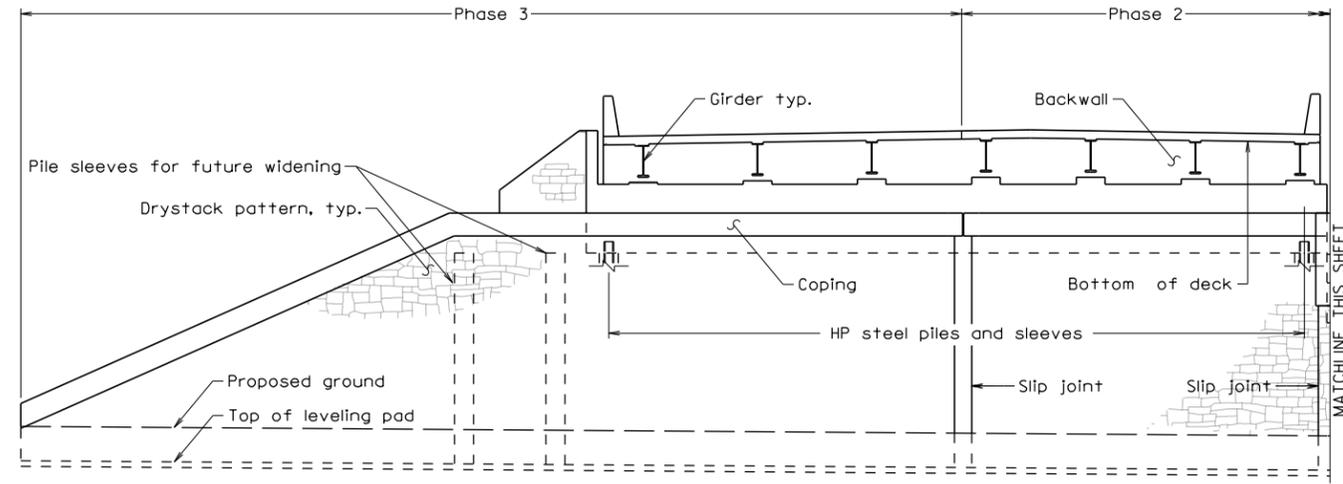


Scale: 1/8" = 1'-0"

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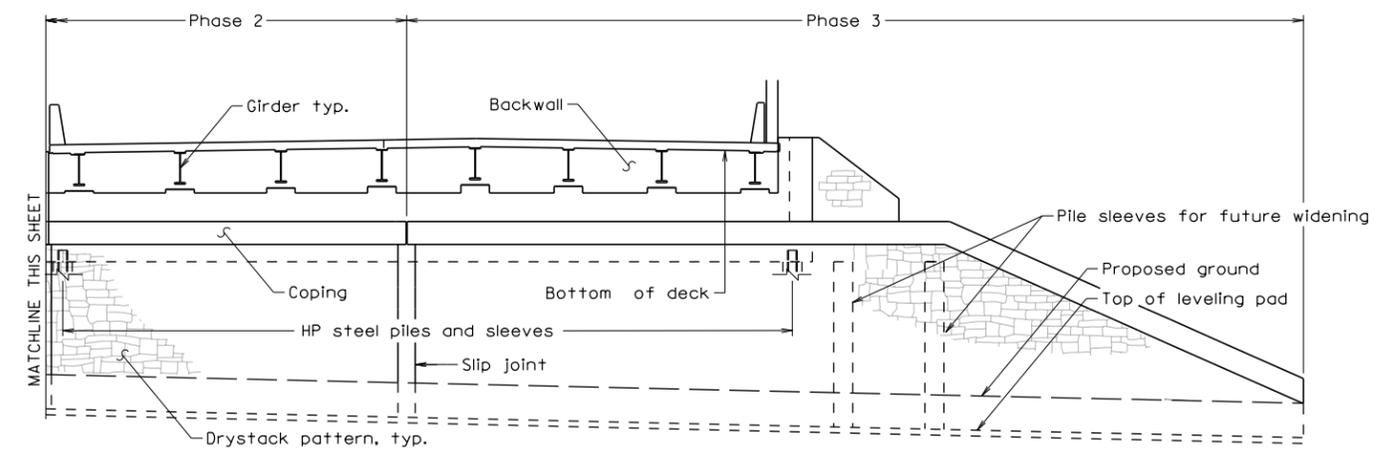
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
I-81 OVER RTE 619			
SEQUENCE OF CONSTRUCTION 87			
No.	Description	Date	Designed: .....
			Drawn: .....
			Checked: .....
Revisions		Date	Plan No.
		Mar. 2021	Sheet No.
			3 of 4

STATE	ROUTE	FEDERAL AID	PROJECT	ROUTE	STATE	PROJECT	SHEET NO.
VA.	—			81	0081-080-946, B686, B687		4



**SBL ELEVATION**

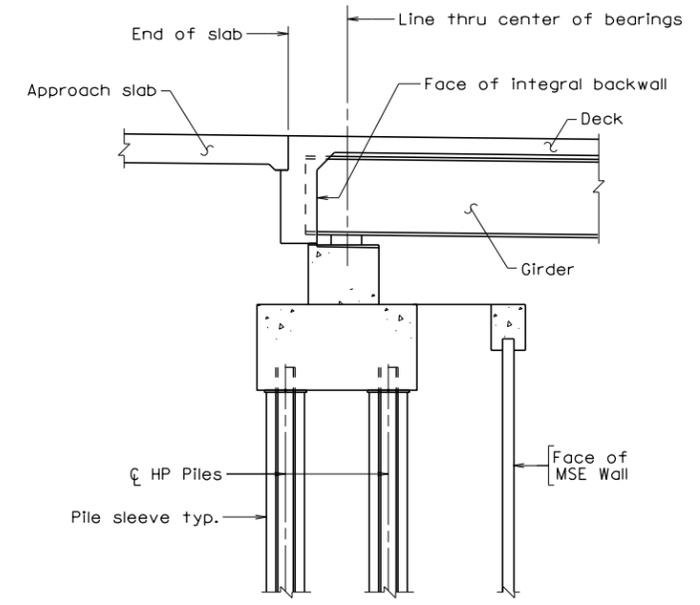
Abutment B shown, Abutment A similar opposite hand.



**NBL ELEVATION**

Abutment B shown, Abutment A similar opposite hand.

Notes:  
 HR-1 railing as required by RFP now shown.  
 Only part of the architectural treatment is shown for clarity.



**TYPICAL SECTION**

Scale: 1/4" = 1'-0"

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

Scale: 1/8" = 1'-0"

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION					
STRUCTURE AND BRIDGE DIVISION					
I-81 OVER RTE 619					
ABUTMENT AND MSE WALL ELEVATION					
					88
No.	Description	Date	Designed: .....	Date	Plan No.
			Drawn: .....	Mar. 2021	
			Checked: .....		Sheet No.
Revisions					4 of 4

Due to the proximity of the bridges, they were combined into a single plan for clarity. This is for the Response to RFP only; plans will be developed for the structures in accordance with VDOT practice for future plan submittals.

STATE	FEDERAL AID	STATE	SHEET NO.
VA.	ROUTE PROJECT	ROUTE PROJECT	
		81 0081-080-946, B677, B678	1
Federal Structure No.		FHWA Construction and Scour Code:	
Federal Stewardship and Oversight Code:			UPC No.

**DESIGN EXCEPTION(S):**

**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: 58'-0" face-to-face of curbs (NBL Str. No. B678).  
70'-0" face-to-face of curbs (SBL Str. No. B677).

Span layout: 140'-0" (NBL Str. No. B678).  
140'-0" (SBL Str. No. B677).

Capacity: HL-93 loading (widening and bearings), HS-20-44 and military loading (existing structure).

**Specifications:**

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

Design: AASHTO LFRD Bridge Design Specifications, 8th Edition, 2017; including Errata and VDOT Modifications (widening and bearings).

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

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

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

All structural steel shall be ASTM A709 Grade 50W and shall be unpainted.

Concrete in superstructure, parapets, and terminal walls shall be Low Shrinkage Class A4 Modified in accordance with Section 217.12(a); in substructure, Class A3.

Concrete surface color coating on the substructure shall be coordinated with the Department.

All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for steels noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications. All reinforcing bar dimensions on the detailed drawings are to centers of bars except where otherwise noted and are subject to fabrication and construction tolerances.

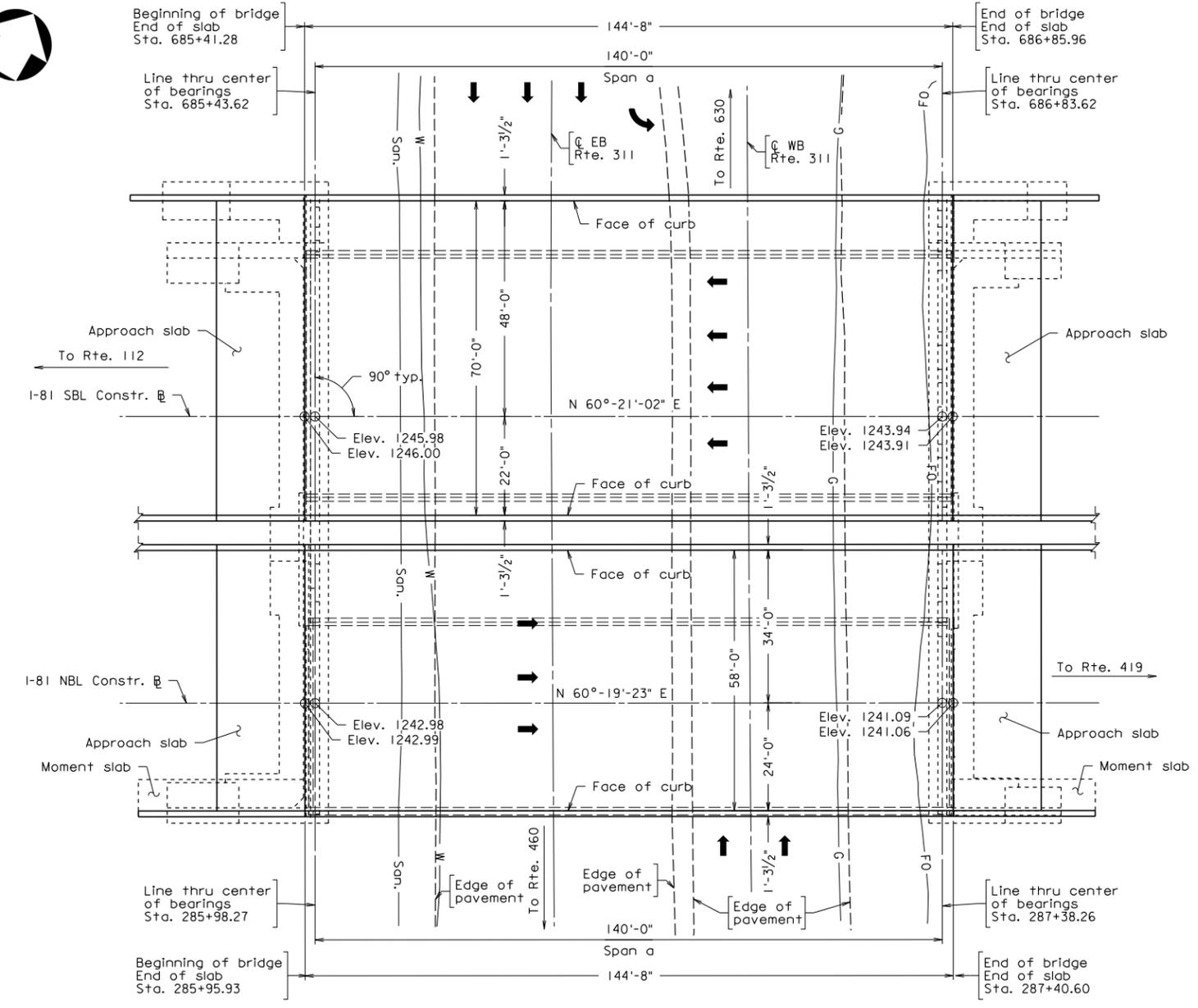
CRR steels shall conform to one or more of the three Classes listed in Section 223 of the Specifications. The Classes of CRR steels required on this project are noted on plan sheets and in the reinforcing steel schedule. CRR Steel, Class II or Class III may be substituted for Class I. CRR Steel, Class III, may be substituted for Class II.

Architectural treatment on the substructure widening/reconstruction shall match the existing substructure architectural treatment.

Bridge No. of existing NBL Str. No. B678 bridge is 2015. Plan No. is 257-79 (NBL Str. No. B678). Bridge No. of existing SBL Str. No. B677 bridge is 2014. Plan No. is 257-79 (SBL Str. No. B677).



**COMMONWEALTH OF VIRGINIA**  
**DEPARTMENT OF TRANSPORTATION**  
**PROPOSED BRIDGE WIDENING ON**  
**I-81 NBL OVER ROUTE 311 (THOMPSON MEMORIAL DRIVE)**  
**ROANOKE CO. - 2.94 MI. N. OF ROUTE 112**  
**PROJ. 0081-080-946, B678**  
**I-81 SBL OVER ROUTE 311 (THOMPSON MEMORIAL DRIVE)**  
**ROANOKE CO. - 1.30 MI. S. OF ROUTE 419**  
**PROJ. 0081-080-946, B677**



**ABUTMENT A** **PLAN** **ABUTMENT B**

Lighting not shown.

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

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

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

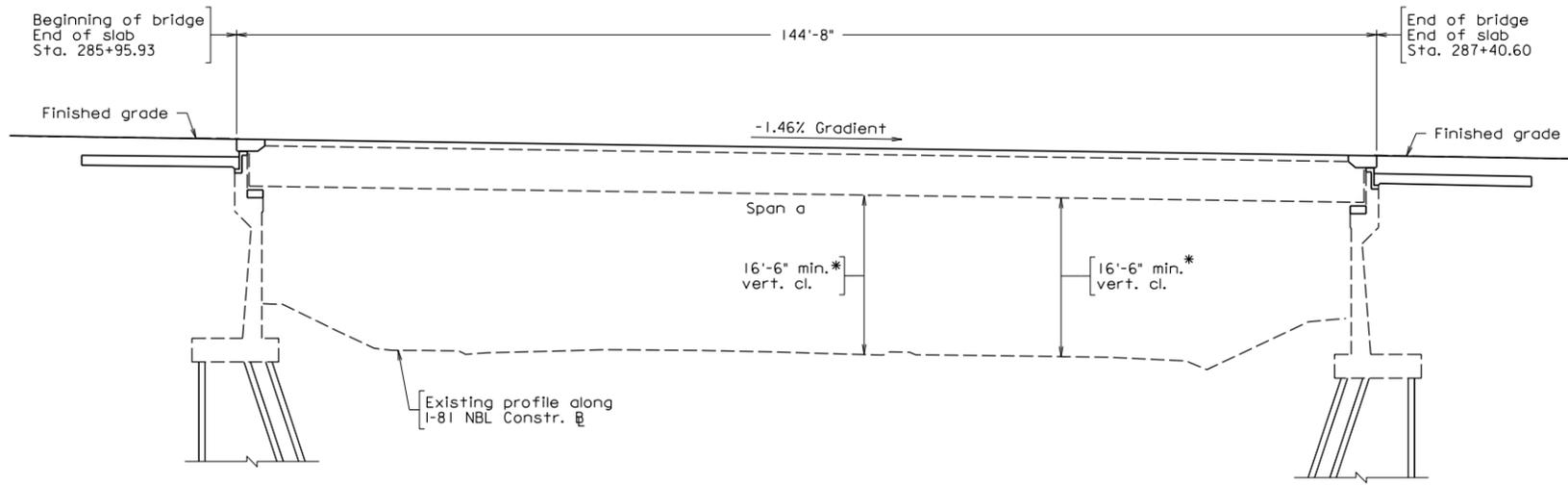
Recommended for Approval: \_\_\_\_\_  
District Project Development Engineer Date

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

Date: March 3, 2021 © 2021, Commonwealth of Virginia Sheet 1 of 5



STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT
VA.		81	0081-080-946, B677, B678
			2

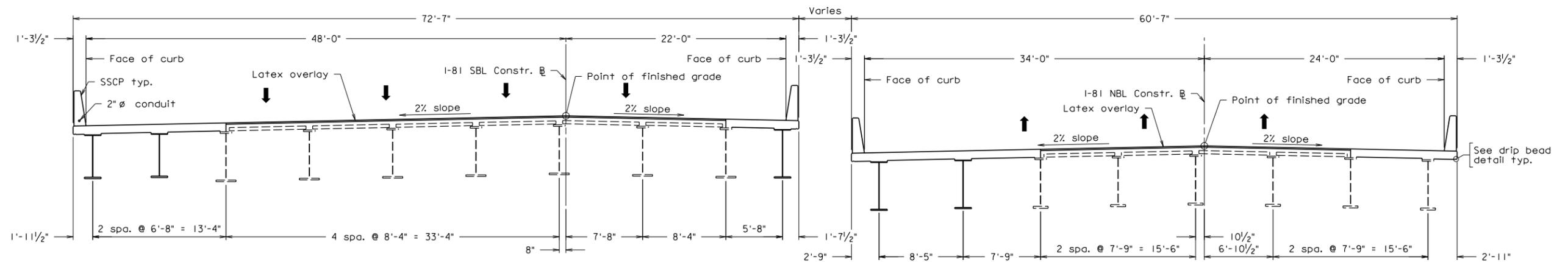


ABUTMENT A

DEVELOPED SECTION ALONG I-81 CONSTR. @

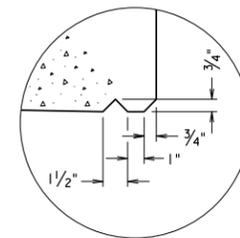
ABUTMENT B

NBL shown, SBL similar.  
\*16'-6" minimum vertical clearance will be exceeded in proposed to provide minimum 16'-6" vertical clearance for future widening.



TRANSVERSE SECTION

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



DRIP DETAIL  
Not to scale

Scale: 3/32" = 1'-0" unless otherwise noted.

PRELIMINARY PLANS

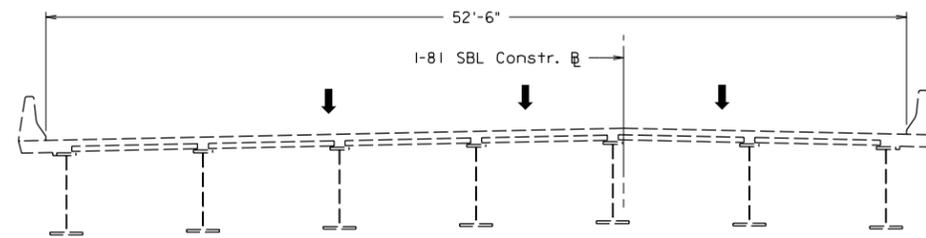
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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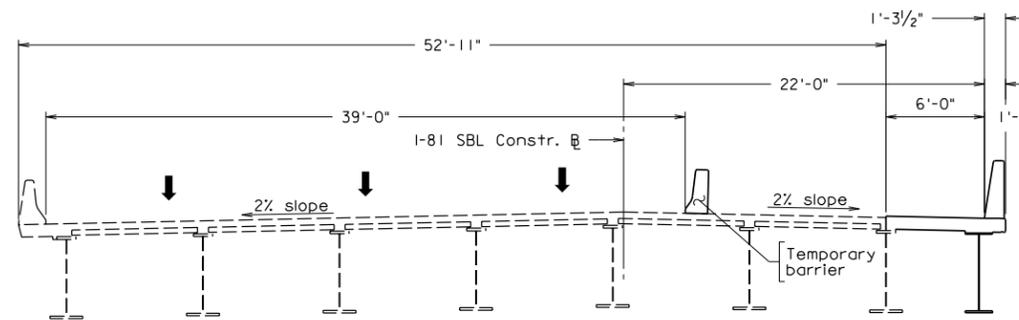
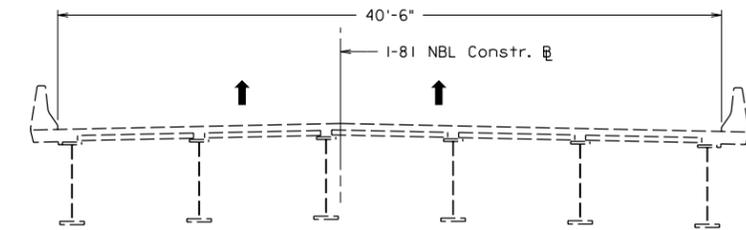
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
I-81 OVER RTE. 311			
DEVELOPED SECTION AND TRANSVERSE SECTION			
No.	Description	Date	Designed: .....
			Drawn: .....
			Checked: .....
			Date
			Mar. 2021
			Plan No.
			257-79A
			Sheet No.
			2 of 5



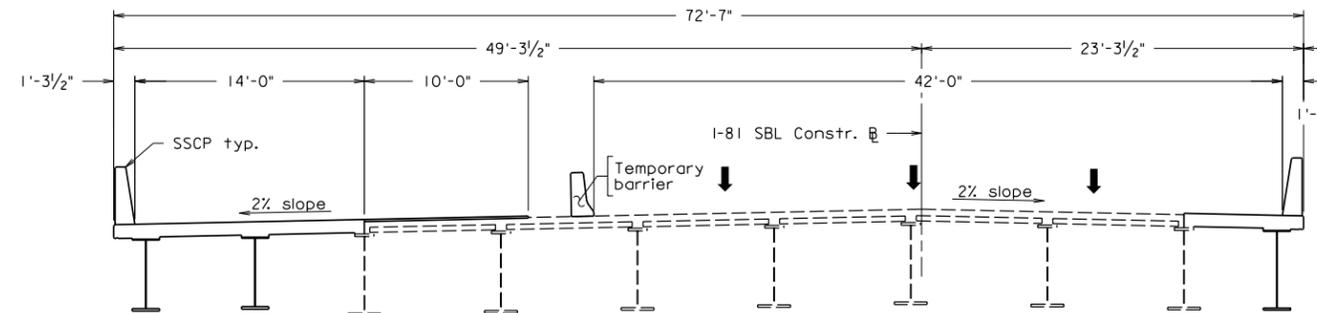
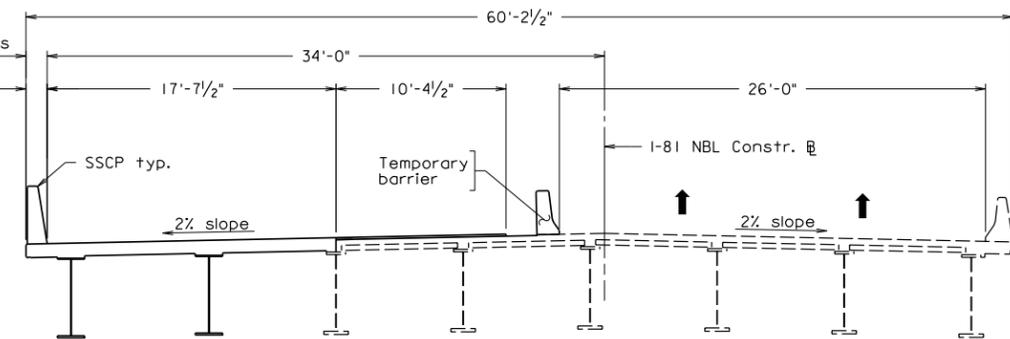
STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-080-946, B677, B678	3



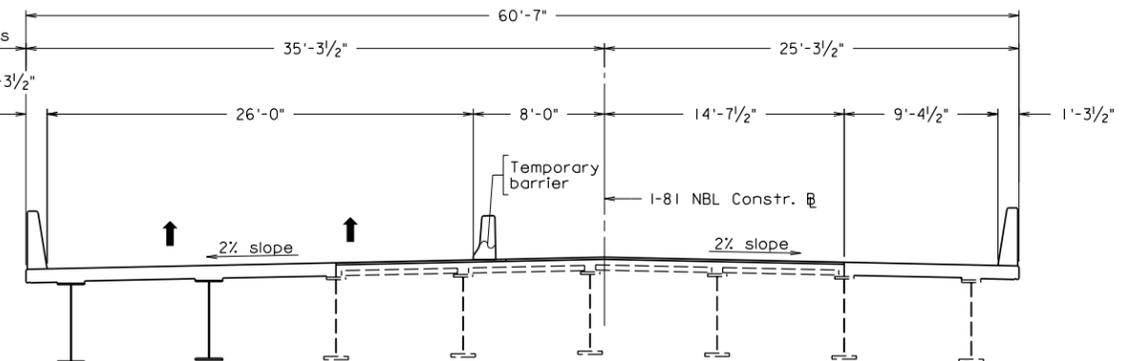
EXISTING



PHASE 2



PHASE 3



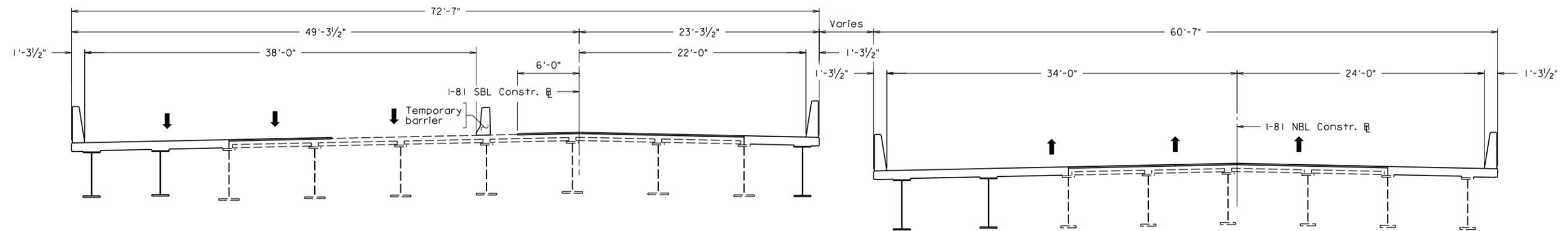
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PRELIMINARY PLANS  
THESE PLANS NOT TO BE USED  
FOR CONSTRUCTION

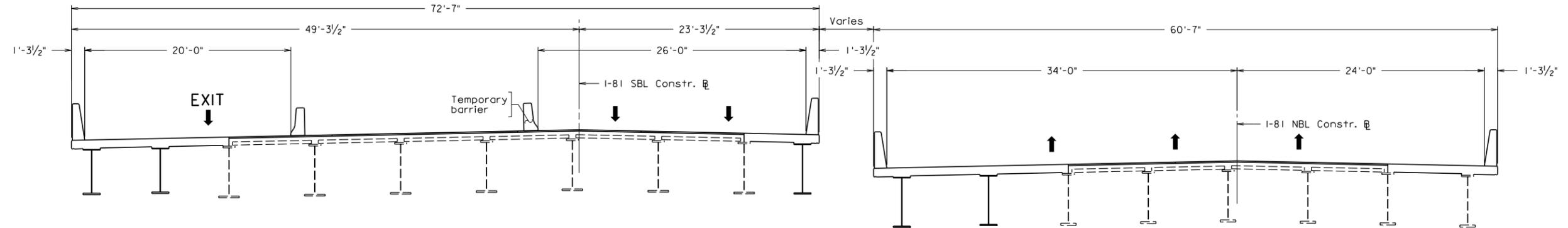
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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
I-81 OVER RTE. 311				
SEQUENCE OF CONSTRUCTION				
SHEET 1 OF 2				
No.	Description	Date	Designed: .....	Date
			Drawn: .....	Mar. 2021
			Checked: .....	
Revisions			Plan No.	Sheet No.
			257-79A	3 of 5

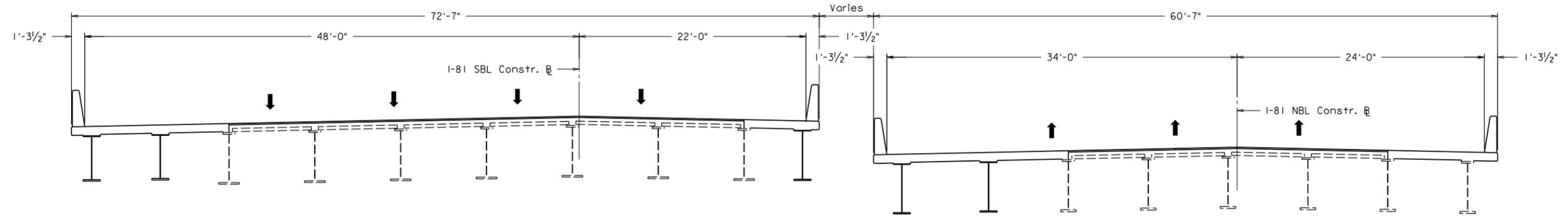
STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-080-946, B677, B678	4



**PHASE 3**  
SBL latex overlay and end of slab reconstruction



**PHASE 3**  
SBL latex overlay and end of slab reconstruction



**FINAL**



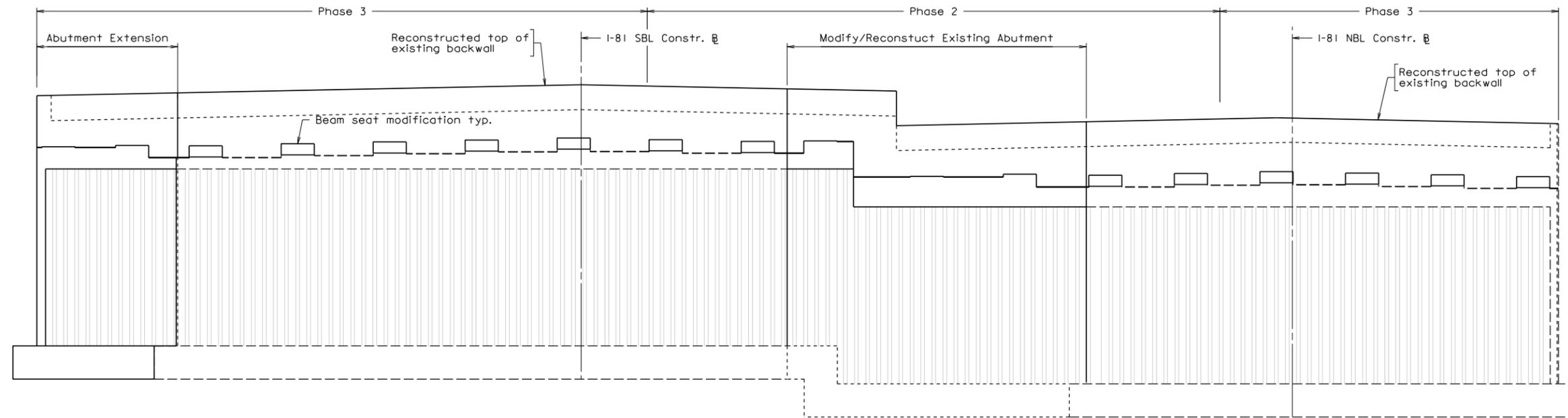
Scale: 3/16" = 1'-0"

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

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
I-81 OVER RTE. 311				
SEQUENCE OF CONSTRUCTION				
SHEET 2 OF 2				
No.	Description	Date	Designed: .....	Date
			Drawn: .....	Plan No.
			Checked: .....	Mar. 2021
Revisions			257-79A	Sheet No.
				4 of 5

STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-080-946, B677, B678	5



**ABUTMENT B ELEVATION**

Abutment A similar opposite hand.  
Piles not shown.



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

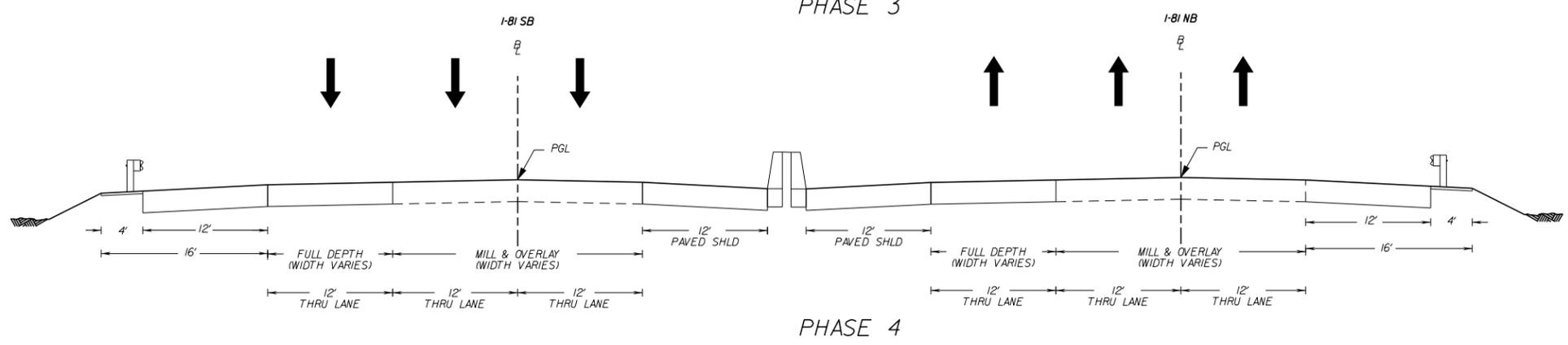
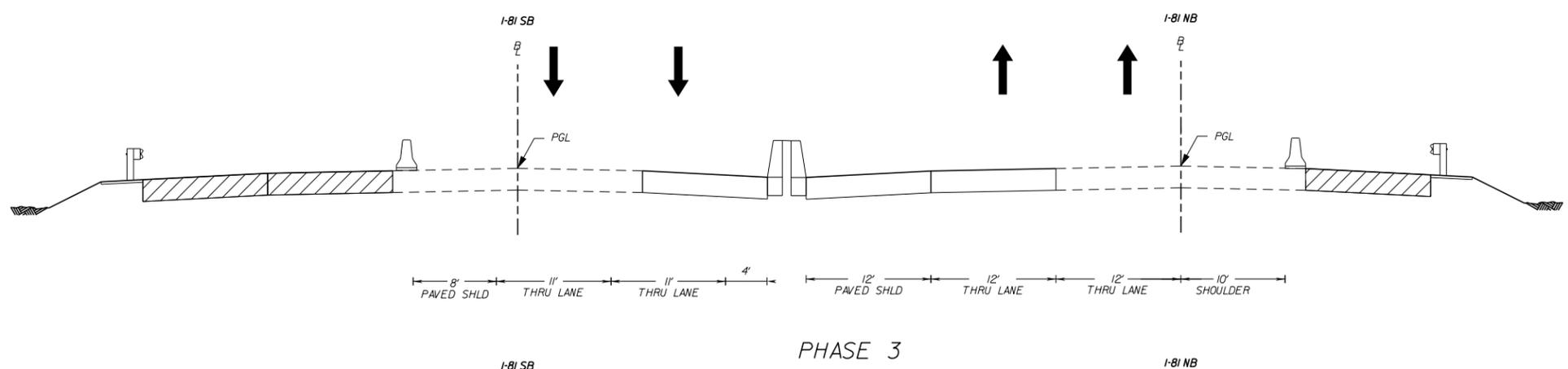
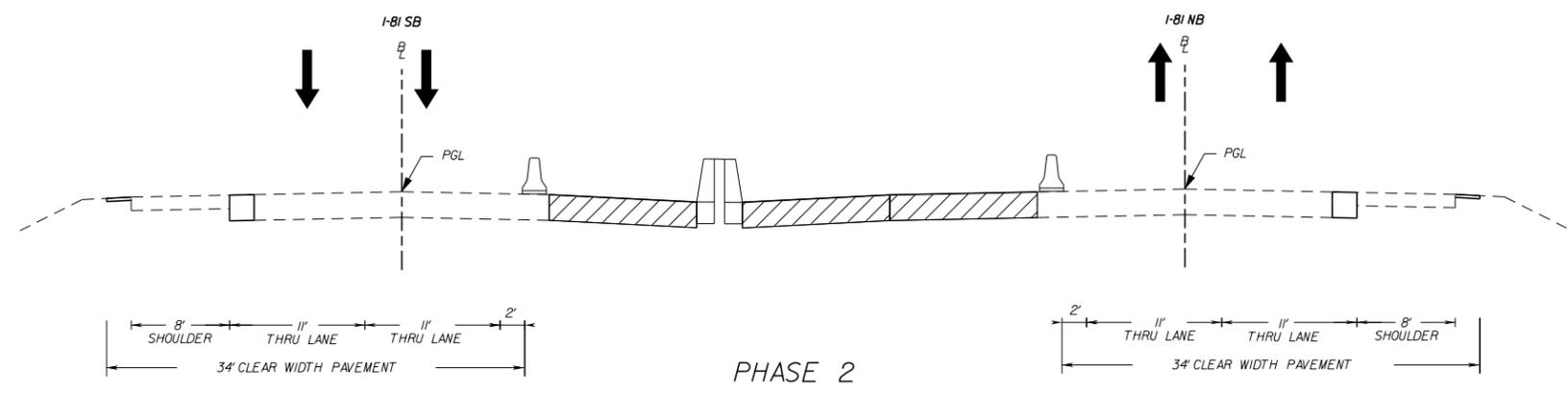
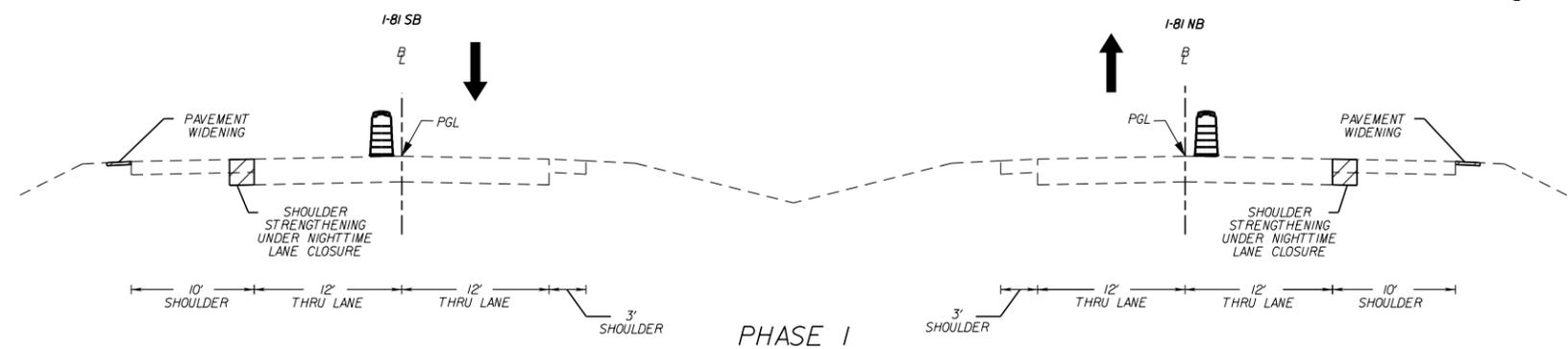
**PRELIMINARY PLANS**  
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION					
STRUCTURE AND BRIDGE DIVISION					
I-81 OVER RTE. 311					
ABUTMENT MODIFICATIONS					
No.	Description	Date	Designed: .....	Date	Plan No.
Revisions			Drawn: .....	Mar. 2021	257-79A
			Checked: .....		5 of 5

C. MAINTENANCE OF TRAFFIC/  
SEQUENCE OF CONSTRUCTION

# MAINTENANCE OF TRAFFIC



TECHNICAL PROPOSAL CONCEPTUAL DESIGN  
 I-81 WIDENING MM 136.6 TO MM 141.8  
 UPC 116203 (PROJECT # 0081-080-946)



\$USER\$

\$DATE\$

\$FILE\$



## TAB 2

Utility Matrix

I-81 Widening MM 136.6 to 141.8 DB Project

UTILITY MATRIX

Date of last update: 3/1/2021

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 #	Project UPC	PLAN SHEET	UTILITY COMPANY	ROADWAY CENTERLINE	TYPE OF FACILITY	SIZE	POLE NUMBER	STATIONS	LEFT, RIGHT, OR BOTH	OFFSETS FROM CENTERLINE	MEASUREMENT UNITS	QUANTITY	TEST HOLES	ADDITIONAL DESCRIPTIVE REMARKS	CONFLICT EVALUATION	ON ROW, OFF ROW, OR IN EASEMENT	COST RESPONSIBILITY	COST RESPONSIBILITY REASON CODE	IN-PLAN or OUT-of-PLAN RELOCATION WORK	DESCRIPTION OF MITIGATION MEASURES THAT D-B CAN PERFORM FOR UTILITY
1	116203	Roll Plot 1	VDOT	I-81 NB	FO			99+52 - 107+13	L	13' - 21'	LF	772			No Conflict	ON ROW	Project			
2	116203	Roll Plot 1	VDOT	I-81 NB	FO			107+13 - 121+44	L	21' - 26'	LF	1432		Cables in conflict with median widening	In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
3	116203	Roll Plot 1	City of Salem	I-81 SB	P			510+16	L	146'	EA	1			No Conflict	OFF ROW	Project	1		
4	116203	Roll Plot 1	City of Salem	I-81 NB	P			112+63	R	136'	EA	1			No Conflict	ON ROW	Project	1		
5	116203	Roll Plot 1	City of Salem	I-81 SB	P			512+68	L	128'	EA	1			No Conflict	OFF ROW	Project	1		
6	116203	Roll Plot 1	City of Salem	I-81 NB	E			113+15 - 113+20	R	163' - 129'	LF	34			No Conflict	ON ROW	Project	1		
7	116203	Roll Plot 1	City of Salem	I-81 NB	E			113+18 - 113+20	R	163' - 129'	LF	36			No Conflict	ON ROW	Project	1		
8	116203	Roll Plot 1	City of Salem	I-81 NB	P			113+20	R	129'	EA	1			No Conflict	ON ROW	Project	1		
9	116203	Roll Plot 1	City of Salem	I-81 NB	P			113+26	R	207'	EA	1			No Conflict	ON ROW	Project	1		
10	116203	Roll Plot 1	City of Salem	I-81 NB	P			113+35	R	163'	EA	1			No Conflict	ON ROW	Project	1		
11	116203	Roll Plot 1	City of Salem	I-81 NB	P			114+91	R	158'	EA	1			No Conflict	ON ROW	Project	1		
12	116203	Roll Plot 1	City of Salem	I-81 NB	P			115+68	R	155'	EA	1			No Conflict	ON ROW	Project	1		
13	116203	Roll Plot 1	City of Salem	I-81 SB	P			520+70	L	227'	EA	1			No Conflict	ON ROW	Project	1		
14	116203	Roll Plot 1	City of Salem	I-81 SB	S	8"		520+75 - 522+02	L	188' - 308'	LF	176		Continues as item # 16	No Conflict	ON ROW	Project	4		
15	116203	Roll Plot 1	VDOT	I-81 NB	FO			121+44 - 130+91	L	26' - 22'	LF	947		Cables in conflict with median widening	In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
16	116203	Roll Plot 1	City of Salem	Rt 112 RPD	S	8"		1304+51 - 1307+76	R	62' - 66'	LF	347		Continuation of Item # 14	No Conflict	ON ROW	Project	4		
17	116203	Roll Plot 1	City of Salem	Rt 112 RPD	S	8"		1304+36 - 1304+51	R	145' - 62'	LF	86			No Conflict	ON ROW	Project	4		
18	116203	Roll Plot 1	City of Salem	Rt 112 RPD	S	8"		1303+08 - 1304+51	R	64' - 62'	LF	169			No Conflict	ON ROW	Project	4		
19	116203	Roll Plot 1	City of Salem	Rt 112 RPD	S	8"		1301+66 - 1303+08	R	119' - 64'	LF	161			No Conflict	ON ROW	Project	4		
20	116203	Roll Plot 1	City of Salem	Rt 112 RPD	P			1307+82	R	85'	EA	1			No Conflict	ON ROW	Project	1		
21	116203	Roll Plot 1	City of Salem	Rt 112 RPD	P			1305+42	R	41'	EA	1			No Conflict	ON ROW	Project	1		
22	116203	Roll Plot 1	Verizon	Rt 112 RPD	T Ped			1304+62	R	89'	EA	1		Phone line feeding this pedestal is missing.	No Conflict	ON ROW	Project	2		
23	116203	Roll Plot 1	City of Salem	Rt 112 RPD	Hydrant			1304+50	R	107'	EA	1		Water line feeding this hydrant is missing.	No Conflict	ON ROW	Project	1		
24	116203	Roll Plot 1	Verizon	Rt 112 RPD	T Ped			1304+13	R	72'	EA	1		Phone line feeding this pedestal is missing.	No Conflict	ON ROW	Project	2		
25	116203	Roll Plot 1	City of Salem	Rt 112 RPD	P			1303+96	R	71'	EA	1			No Conflict	ON ROW	Project	1		
27	116203	Roll Plot 1	City of Salem	Rt 112 RPD	P			1302+52	R	109'	EA	1			No Conflict	ON ROW	Project	1		
28	116203	Roll Plot 1	Roanoke Gas	Rt 112 BL	G	4"		1404+50 - 1408+00	L	41' - 39'	LF	352		Conflict #1: Possible conflict with replacement of storm drain.	Possible Conflict	ON ROW	Project	2	OUT-of-PLAN	Assistance with traffic control and providing an area to park equipment.
29	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1404+46	R	53'	EA	1			No Conflict	ON ROW	Project	1		
30	116203	Roll Plot 1	Citizens	Rt 112 BL	Tel Cab			1404+46	R	51'	EA	1			No Conflict	ON ROW	Utility	9		
31	116203	Roll Plot 1	Verizon	Rt 112 BL	T Ped			1404+46	R	54'	EA	1			No Conflict	ON ROW	Project	2		
32	116203	Roll Plot 1	City of Salem	Rt 112 BL	W	12"		1404+50 - 1408+00	L	35' - 36'	LF	352	None	Possible conflict with existing 12" water main and proposed storm sewer. Vertical separation is approximately 4 inches. Water main is on top.	Possible Conflict	ON ROW	Project	1	IN-PLAN	IN-PLAN WORK: Relocate existing 12" water main under existing and proposed storm sewers at Sta. 1408+78

I-81 Widening MM 136.6 to 141.8 DB Project

UTILITY MATRIX

Date of last update: 3/1/2021

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 #	Project UPC	PLAN SHEET	UTILITY COMPANY	ROADWAY CENTERLINE	TYPE OF FACILITY	SIZE	POLE NUMBER	STATIONS	LEFT, RIGHT, OR BOTH	OFFSETS FROM CENTERLINE	MEASUREMENT UNITS	QUANTITY	TEST HOLES	ADDITIONAL DESCRIPTIVE REMARKS	CONFLICT EVALUATION	ON ROW, OFF ROW, OR IN EASEMENT	COST RESPONSIBILITY	COST RESPONSIBILITY REASON CODE	IN-PLAN or OUT-of-PLAN RELOCATION WORK	DESCRIPTION OF MITIGATION MEASURES THAT D-B CAN PERFORM FOR UTILITY
33	116203	Roll Plot 1	WVWS	Rt 112 BL	S	10"		1404+50 - 1406+67	R	40' - 34'	LF	216	None	Possible horizontal conflict with existing sanitary sewer manhole. Vertical separation between existing sanitary sewer pipe and proposed storm sewer is approximately 17 - 32 inches. Gravity sewer is under storm.	Possible Conflict	ON ROW	Project	4	IN-PLAN	Adjust location of proposed storm sewer to avoid manhole.
34	116203	Roll Plot 1	Citizens	Rt 112 BL	FO	1 - 240 Count		1404+62 - 1405+89	R	39' - 68'	LF	138		Possible conflict with replacement of storm drain pipe	Possible Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
35	116203	Roll Plot 1	Verizon	Rt 112 BL	Tel Cab			1405+70	L	66'	EA	1			No Conflict	ON ROW	Project	2		
36	116203	Roll Plot 1	Verizon	Rt 112 BL	T			1405+70 - 1406+01	L	66' - 104'	LF	51			No Conflict	ON ROW	Project	2		
38	116203	Roll Plot 1	Verizon	Rt 112 BL	P			1406+01	L	104'	EA	1			No Conflict	ON ROW	Project	2		
39	116203	Roll Plot 1	WVWS	Rt 112 BL	S	10"		1406+67 - 1408+01	R	34' - 37'	LF	134	None	see comment for Item 33	Possible Conflict	ON ROW	Project	4	IN-PLAN	Adjust location of proposed storm sewer to avoid manhole.
40	116203	Roll Plot 1	Roanoke Gas	Rt 112 BL	G	4"		1408+00 - 1412+00	L	39' - 40'	LF	403			No Conflict	ON ROW	Project	2		
41	116203	Roll Plot 1	City of Salem	Rt 112 BL	W	12"		1408+00 - 1412+00	L	36' - 36'	LF	403	4, 5, 6	Conflict to be avoided by limiting subgrade removal of existing bridge foundations to proximity and methods that will not damage existing water main	No Conflict	ON ROW	Project	1		
42	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1408+05	L	49'	EA	1			No Conflict	ON ROW	Project	1		
43	116203	Roll Plot 1	Verizon	Rt 112 BL	P			1408+20	L	84'	EA	1			No Conflict	ON ROW	Project	2		
44	116203	Roll Plot 1	Comcast	Rt 112 BL	CATV			1408+05 - 1411+54	L	49' - 57'	LF	362		Conflict #2: Line in conflict with new bridge substructure	In Conflict	ON ROW	Project	2	OUT-of-PLAN	Assistance with traffic control and providing an area to park equipment.
45	116203	Roll Plot 1	Segra	Rt 112 BL	FO			1408+05 - 1411+54	L	49' - 57'	LF	360			No Conflict	ON ROW	Project	2		
46	116203	Roll Plot 1	Comcast	Rt 112 BL	CAFO			1408+05 - 1411+54	L	49' - 57'	LF	360			No Conflict	ON ROW	Project	2		
47	116203	Roll Plot 1	Zayo	Rt 112 BL	FO			1408+05 - 1411+54	L	49' - 57'	LF	359			No Conflict	ON ROW	Project	2		
48	116203	Roll Plot 1	Comcast	Rt 112 BL	CATV			1408+05 - 1411+54	L	49' - 57'	LF	368			No Conflict	ON ROW	Project	2		
49	116203	Roll Plot 1	Verizon	Rt 112 BL	T			1408+20 - 1411+54	L	84' - 57'	LF	342		Conflict #3: Line in conflict with new bridge substructure	In Conflict	ON ROW	Project	2	OUT-of-PLAN	Assistance with traffic control and providing an area to park equipment.
50	116203	Roll Plot 1	City of Salem	Rt 112 BL	E			1408+05 - 1411+54	L	49' - 57'	LF	375			No Conflict	ON ROW	Project	1		
51	116203	Roll Plot 1	WVWS	Rt 112 BL	S	10"		1408+01 - 1410+78	R	37' - 38'	LF	274	7, 8, 9	Conflict to be avoided by limiting subgrade removal of existing bridge foundations to proximity and methods that will not damage existing sewer main	No Conflict	ON ROW	Project	4		
52	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1411+54	L	57'	EA	1			No Conflict	ON ROW	Project	1		
53	116203	Roll Plot 1	WVWS	Rt 112 BL	S	10"		1410+78 - 1414+75	R	38'	LF	394	None	8.5 feet deep at manhole Sta. 1414+75	No Conflict	ON ROW	Project	4		
54	116203	Roll Plot 1	Roanoke Gas	Rt 112 BL	G	4"		1412+00 - 1418+24	L	40' - 35'	LF	629		Conflict #4: possible conflict with a replacement storm drain pipe and new pavement widening.	Possible Conflict	ON ROW	Project	2	OUT-of-PLAN	Assistance with traffic control and providing an area to park equipment.
55	116203	Roll Plot 1	City of Salem	Rt 112 BL	W	12"		1412+00 - 1419+22	L	36' - 22'	LF	722	None	Possible conflict with proposed pavement section (proximity during construction <2 feet) and proposed storm sewer pipe. TH #4 notes "exposed water main was corroded".	Possible Conflict	ON ROW	Project	1	IN-PLAN	Optional not shown on plans: Relocate ~450 LF existing 12" water main from approx Sta. 1411+00 to 1415+50 to avoid conflict with excavation for new pavement and proposed storm sewer. Assign risk percentage <100% for opportunity to avoid conflict & relocation.
56	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1413+32	L	53'	EA	1			No Conflict	ON ROW	Project	1		
57	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1415+09	L	55'	EA	1			No Conflict	ON ROW	Project	1		
58	116203	Roll Plot 1	WVWS	Rt 112 BL	S	10"		1410+73 - 1410+78	R	54' - 38'	LF	17			No Conflict	ON ROW	Project	4		
59	116203	Roll Plot 1	WVWS	Rt 112 BL	S	10"		1410+73 - 1410+76	R	54' - 92'	LF	38			No Conflict	ON ROW	Project	4		

I-81 Widening MM 136.6 to 141.8 DB Project

UTILITY MATRIX

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Item #	Project UPC	PLAN SHEET	UTILITY COMPANY	ROADWAY CENTERLINE	TYPE OF FACILITY	SIZE	POLE NUMBER	STATIONS	LEFT, RIGHT, OR BOTH	OFFSETS FROM CENTERLINE	MEASUREMENT UNITS	QUANTITY	TEST HOLES	ADDITIONAL DESCRIPTIVE REMARKS	CONFLICT EVALUATION	ON ROW, OFF ROW, OR IN EASEMENT	COST RESPONSIBILITY	COST RESPONSIBILITY REASON CODE	IN-PLAN or OUT-of-PLAN RELOCATION WORK	DESCRIPTION OF MITIGATION MEASURES THAT D-B CAN PERFORM FOR UTILITY
60	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1416+44	L	54'	EA	1			No Conflict	ON ROW	Project	1		
61	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1417+26	L	54'	EA	1			No Conflict	ON ROW	Project	1		
62	116203	Roll Plot 1	City of Salem	Rt 112 BL	P			1417+93	L	76'	EA	1			No Conflict	ON ROW	Project	1		
63	116203	Roll Plot 1	AEP	Rt 112 BL	P			1418+26	L	62'	EA	1		Service pole for what appears to be a weather station	No Conflict	OFF ROW	Project	7		
64	116203	Roll Plot 1	WVWS	I-81 SB	S	8"		531+77 - 534+45	L	105'	LF	268			No Conflict	ON ROW	Project	4		
65	116203	Roll Plot 1	WVWS	I-81 SB	S	8"		534+45 - 534+78	L	105' - 186'	LF	86			No Conflict	ON ROW	Project	4		
66	116203	Roll Plot 1	WVWS	I-81 SB	S	8"		534+78 - 536+29	L	186' - 123'	LF	180			No Conflict	ON ROW	Project	4		
67	116203	Roll Plot 1	WVWS	I-81 SB	S	8"		536+29 - 536+90	L	123' - 178'	LF	82			No Conflict	ON ROW	Project	4		
68	116203	Roll Plot 1	WVWS	I-81 SB	S	8"		536+90 - 537+54	L	178' - 275'	LF	114			No Conflict	OFF ROW	Project	4		
69	116203	Roll Plot 1	VDOT	I-81 NB	FO			130+91 - 133+66	L	21' - 22'	LF	300			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
70	116203	Roll Plot 1	VDOT	I-81 NB	FO			133+66 - 144+40	L	22' - 21'	LF	1074			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
71	116203	Roll Plot 1	VDOT	I-81 NB	FO			144+40 - 154+23	L	21' - 23'	LF	983			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
72	116203	Roll Plot 1	VDOT	I-81 NB	FO			154+23 - 161+79	L	23' - 26'	LF	756			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
73	116203	Roll Plot 1	VDOT	I-81 NB	FO			161+79 - 170+59	L	26' - 27'	LF	880			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
74	116203	Roll Plot 1	VDOT	I-81 NB	FO			170+59 - 183+31	L	27' - 28'	LF	1272			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
75	116203	Roll Plot 1	VDOT	I-81 NB	FO			183+31 - 195+18	L	28' - 19'	LF	1187			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
76	116203	Roll Plot 1	Citizens	I-81 SB	FO	1 - 240 Count		585+87 - 594+29	R	26 - 36'	LF	842		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
77	116203	Roll Plot 1	Citizens	I-81 SB	FO	1 - 240 Count		574+88 - 585+87	R	26' - 26'	LF	1099		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
78	116203	Roll Plot 1	Citizens	I-81 SB	FO	1 - 240 Count		548+03 - 574+88	R	26' - 26'	LF	2685		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
79	116203	Roll Plot 1	Citizens	I-81 SB	FO	1 - 240 Count		548+03	B	26'L - 71'R	LF	120		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
80	116203	Roll Plot 1	Citizens	RT 112 RPB BL	FO	1 - 240 Count		1100+66 - 1115+42	R	17' - 17'	LF	1471		Possible conflict with sound wall construction	Possible Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
81	116203	Roll Plot 1	VDOT	RT 112 RPB BL	E			145+35 - 146+60	B	46' L - 47' R	LF	241			No Conflict	ON ROW	Project			
82	116203	Roll Plot 1	City of Salem	I-81 NB	E			144+77 - 148+09	R	46' - 45'	LF	333			No Conflict	ON ROW	Project	1	OUT-of-PLAN	
83	116203	Roll Plot 1	Verizon	I-81 SB	FO			559+35 - 559+74	B	156' R - 170' L	LF	327			Possible Conflict	ON ROW	Utility		OUT-of-PLAN	Assistance with traffic control and providing an area to park equipment.
84	116203	Roll Plot 1	City of Salem	RT 112 RPB BL	P			1101+84	R	129'	EA	1			No Conflict	ON ROW	Project	1		
85	116203	Roll Plot 1	City of Salem	RT 112 RPB BL	P			1107+53	R	109'	EA	1			No Conflict	ON ROW	Project	1		
86	116203	Roll Plot 1	City of Salem	RT 112 RPB BL	P			1109+35	R	106'	EA	1			No Conflict	ON ROW	Project	1		
87	116203	Roll Plot 1	City of Salem	RT 112 RPB BL	P			1111+86	R	86'	EA	1			No Conflict	ON ROW	Project	1		
88	116203	Roll Plot 1	City of Salem	RT 112 RPB BL	P			1118+76	R	76'	EA	1			No Conflict	ON ROW	Project	1		
89	116203	Roll Plot 1	AEP	I-81 SB	P			559+77	L	167'	EA	1			No Conflict	ON ROW	Utility			

I-81 Widening MM 136.6 to 141.8 DB Project

UTILITY MATRIX

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90	116203	Roll Plot 1	AEP	I-81 SB	P			559+39	L	158'	EA	1			No Conflict	ON ROW	Utility			
91	116203	Roll Plot 1	WVWS	RT 112 BL	S	8"		1417+61 - 1417+44	L	108' - 62'	LF	47			No Conflict	ON ROW	Project	4		
92	116203	Roll Plot 1	WVWS	RT 112 BL	S	8"		1417+44 - 1417+17	B	62' L - 39' R	LF	102			No Conflict	ON ROW	Project	4		
93	116203	Roll Plot 1	WVWS	RT 112 BL	S	10"		1417+17 - 1414+74	R	39' - 34'	LF	237	None	Possible conflict with method of construction for proposed storm sewer pipes. Proposed vertical separation between existing gravity sewer and proposed storm sewer approx 6 inches.	Possible Conflict	ON ROW	Project	4	IN-PLAN	
94	116203	Roll Plot 1	WVWS	RT 112 BL	W	12"		1417+80 - 1408+55	B	27' L - 591' R	LF	1132			No Conflict	ON ROW	Project	4		
95	116203	Roll Plot 1	WVWS	I-81 SB	W	12"		537+16 - 540+11	L	132' - 167'	LF	304			No Conflict	ON ROW	Project	4		
96	116203	Roll Plot 1	WVWS	I-81 SB	W	12"		540+11 - 559+07	L	167' - 110'	LF	1919			No Conflict	ON ROW	Project	4		
97	116203	Roll Plot 1	WVWS	I-81 SB	W	12"		559+07 - 565+95	L	110' - 304'	LF	751			No Conflict	ON ROW	Project	4		
98	116203	Roll Plot 1	WVWS	RT 112 BL	G	Unknown		1418+20 - 1408+52	B	34' L - 634' R	LF	1170			No Conflict	ON ROW	Project	4		
99	116203	Roll Plot 1	AEP	RT 112 BL	P			1417+57	R	242'	EA	1			No Conflict	OFF ROW	Project	7		
100	116203	Roll Plot 1	AEP	RT 112 BL	P			1414+53	R	379'	EA	1			No Conflict	OFF ROW	Project	7		
101	116203	Roll Plot 1	AEP	RT 112 BL	P			1413+10	R	432'	EA	1			No Conflict	OFF ROW	Project	7		
102	116203	Roll Plot 1	AEP	I-81 SB	P			536+04	L	233'	EA	1			No Conflict	OFF ROW	Project	7		
103	116203	Roll Plot 1	AEP	I-81 SB	P			536+92	L	210'	EA	1			No Conflict	OFF ROW	Project	7		
104	116203	Roll Plot 1	AEP	I-81 SB	P			544+33	L	251'	EA	1			No Conflict	OFF ROW	Project	7		
105	116203	Roll Plot 1	AEP	I-81 SB	E			546+58	L	335'	EA	1			No Conflict	OFF ROW	Project	7		
106	116203	Roll Plot 1	AEP	I-81 SB	E			549+40	L	165'	EA	1			No Conflict	OFF ROW	Project	7		
107	116203	Roll Plot 1	Verizon	I-81 SB	P			551+11	L	157'	EA	1			No Conflict	ON ROW	Utility			
108	116203	Roll Plot 1	Verizon	I-81 SB	P			552+92	L	164'	EA	1			No Conflict	ON ROW	Utility			
109	116203	Roll Plot 1	Verizon	I-81 SB	P			555+07	L	164'	EA	1			No Conflict	ON ROW	Utility			
110	116203	Roll Plot 1	AEP	I-81 SB	E			550+07	L	130'	EA	1			No Conflict	ON ROW	Utility			
111	116203	Roll Plot 1	AEP	I-81 SB	E			553+20	L	128'	EA	1			No Conflict	ON ROW	Utility			
112	116203	Roll Plot 1	AEP	I-81 SB	E			555+06	L	120'	EA	1			No Conflict	ON ROW	Utility			
113	116203	Roll Plot 1	AEP	I-81 SB	E			557+52	L	117'	EA	1			No Conflict	ON ROW	Utility			
114	116203	Roll Plot 1	AEP	I-81 SB	E			561+56	L	156'	EA	1			No Conflict	ON ROW	Utility			
115	116203	Roll Plot 1	AEP	I-81 SB	E			563+38	L	160'	EA	1			No Conflict	ON ROW	Utility			
116	116203	Roll Plot 1	AEP	I-81 SB	P			564+15	L	193'	EA	1			No Conflict	ON ROW	Utility			
117	116203	Roll Plot 1	AEP	I-81 SB	P			565+09	L	220'	EA	1			No Conflict	ON ROW	Utility			
118	116203	Roll Plot 1	AEP	I-81 SB	P			564+20	L	194'	EA	1			No Conflict	ON ROW	Utility			
119	116203	Roll Plot 1	AEP	I-81 SB	P			565+20	L	105'	EA	1			No Conflict	ON ROW	Utility			
120	116203	Roll Plot 1	City of Salem	Rt 112 RPB BL	P			1101+94	R	129'	EA	1			No Conflict	ON ROW	Project	1		
121	116203	Roll Plot 1	City of Salem	Rt 112 RPB BL	P			1107+60	R	109'	EA	1			No Conflict	ON ROW	Project	1		

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122	116203	Roll Plot 1	City of Salem	Rt 112 RPB BL	P			1109+36	R	107'	EA	1			No Conflict	ON ROW	Project	1		
123	116203	Roll Plot 1	City of Salem	Rt 112 RPB BL	P			1111+58	R	86'	EA	1			No Conflict	ON ROW	Project	1		
124	116203	Roll Plot 1	VDOT	Rt 112 RPB BL	P			1115+12	R	36'	EA	1			No Conflict	ON ROW	Project			
125	116203	Roll Plot 1	City of Salem	Rt 112 RPB BL	P			1118+81	R	151'	EA	1			No Conflict	ON ROW	Project	1		
126	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		594+29 - 597+74	B	36'R - 45'L	LF	376		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
127	116203	Roll Plot 2	VDOT	I-81 SB	FO			594+52 - 599+40	R	54' - 53'	LF	516			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
128	116203	Roll Plot 2	Citizens	I-81 SB	T Ped			597+74	L	45'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
129	116203	Roll Plot 2	Citizens	I-81 SB	P			597+74	L	47'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
130	116203	Roll Plot 2	Citizens	I-81 SB	P			598+63	L	41'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
131	116203	Roll Plot 2	Citizens	I-81 SB	T Ped			598+64	L	43'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
132	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		598+64 - 608+80	B	43'L - 27'R	LF	1059		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
133	116203	Roll Plot 2	VDOT	I-81 SB	FO			599+40 - 619+72	R	53' - 47'	LF	2034			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
134	116203	Roll Plot 2	City of Salem	I-81 NB	P			197+72	R	184'	EA	1			No Conflict	ON ROW	Project	2		
135	116203	Roll Plot 2	City of Salem	I-81 NB	E			197+72 - 198+91	B	184'R - 162'L	LF	367			No Conflict	ON ROW	Project	2		
136	116203	Roll Plot 2	Comcast	I-81 NB	CATV			198+11 - 198+91	B	79'R - 162'L	LF	256		This line is shown in the designation but Google Earth street view does not show it at the pole.	No Conflict	ON ROW	Utility			
137	116203	Roll Plot 2	City of Salem	I-81 NB	P			193+41	R	114'	EA	1			No Conflict	OFF ROW	Project	7		
138	116203	Roll Plot 2	City of Salem	I-81 NB	P			195+88	R	155'	EA	1			No Conflict	OFF ROW	Project	7		
139	116203	Roll Plot 2	City of Salem	I-81 NB	P			197+86	R	138'	EA	1		has streetlight	No Conflict	ON ROW	Project	2		
140	116203	Roll Plot 2	City of Salem	I-81 NB	P			198+28	R	138'	EA	1		Guy Pole Only	No Conflict	ON ROW	Project	2		
141	116203	Roll Plot 2	City of Salem	I-81 NB	W	6"		197+71 - 198+00	R	233' - 139'	LF	99	None	Possible conflict with existing 6" water main. Proposed vertical separation approx 26 inches.	Possible Conflict	ON ROW	Project	1	IN-PLAN	
142	116203	Roll Plot 2	City of Salem	I-81 NB	S	8"		197+72 - 197+87	R	275' - 233'	LF	44		Existing manhole within pavement mill & overlay area.	Possible Conflict	ON ROW	Project	1	IN-PLAN	
143	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		608+80 - 614+45	R	27' - 29'	LF	566		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
144	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		614+45 - 619+80	B	29'R - 69'L	LF	601		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
145	116203	Roll Plot 2	Citizens	I-81 SB	T Ped			619+80	L	69'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
146	116203	Roll Plot 2	Citizens	I-81 SB	P			619+78	L	69'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
147	116203	Roll Plot 2	VDOT	I-81 SB	FO			619+72 - 621+32	R	47' - 46'	LF	185			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
148	116203	Roll Plot 2	City of Salem	I-81 SB	W			620+19 - 620+27	L	187'	LF	7		spur to hydrant	No Conflict	ON ROW	Project	1		
149	116203	Roll Plot 2	City of Salem	Rte 619	W	8"		34+54 - 39+37	L	12' - 13'	LF	487	13, 14, 15	Possible conflict between existing water main and proposed demolition of existing bridge piers	Possible Conflict	ON ROW	Project	1	IN-PLAN	Horizontal clearance between edge of bridge column and water main -6-8 feet. Protect during construction to avoid conflict.

I-81 Widening MM 136.6 to 141.8 DB Project

UTILITY MATRIX

Date of last update: 3/1/2021

Cost Responsibility Reason Codes

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Item #	Project UPC	PLAN SHEET	UTILITY COMPANY	ROADWAY CENTERLINE	TYPE OF FACILITY	SIZE	POLE NUMBER	STATIONS	LEFT, RIGHT, OR BOTH	OFFSETS FROM CENTERLINE	MEASUREMENT UNITS	QUANTITY	TEST HOLES	ADDITIONAL DESCRIPTIVE REMARKS	CONFLICT EVALUATION	ON ROW, OFF ROW, OR IN EASEMENT	COST RESPONSIBILITY	COST RESPONSIBILITY REASON CODE	IN-PLAN or OUT-of-PLAN RELOCATION WORK	DESCRIPTION OF MITIGATION MEASURES THAT D-B CAN PERFORM FOR UTILITY
150	116203	Roll Plot 2	Roanoke Gas	Rte 619	G	3"		34+50 - 39+36	B	12'L - 12'R	LF	517			No Conflict	ON ROW	Project	2		
151	116203	Roll Plot 2	City of Salem	Rte 619	S	8"		34+50 - 34+96	R	14' - 5'	LF	47			No Conflict	ON ROW	Project	1		
152	116203	Roll Plot 2	City of Salem	Rte 619	S	8"		34+96 - 37+40	R	5'	LF	242	19, 20, 21		No Conflict	ON ROW	Project	1		
153	116203	Roll Plot 2	City of Salem	Rte 619	S	8"		37+40 - 39+45	R	5' - 42'	LF	202			No Conflict	ON ROW	Project	1		
154	116203	Roll Plot 2	Verizon	Rte 619	T			34+50 - 34+87	R	14' - 28'	LF	43			No Conflict	ON ROW	Project	2		
155	116203	Roll Plot 2	AEP	Rte 619	P			34+87	R	31'	EA	1			No Conflict	OFF ROW	Project	7		
156	116203	Roll Plot 2	Verizon	Rte 619	T			34+87 - 38+14	R	28' - 35'	LF	324		Conflict #5: Line in possible conflict with new MSE wall	Possible Conflict	ON ROW	Project	2	OUT-of-PLAN	Assistance with traffic control and providing an area to park equipment.
157	116203	Roll Plot 2	Comcast	Rte 619	CATV			34+87 - 37+67	R	31' - 11'	LF	290			No Conflict	ON ROW	Project	2		
158	116203	Roll Plot 2	AEP	Rte 619	E			34+87 - 38+20	R	31' - 34'	LF	344			No Conflict	ON ROW	Project	2		
159	116203	Roll Plot 2	Comcast	Rte 619	CATV			34+87 - 38+20	R	31' - 34'	LF	339			No Conflict	ON ROW	Project	2		
160	116203	Roll Plot 2	Comcast	Rte 619	CAFO			34+87 - 38+20	R	31' - 34'	LF	341			No Conflict	ON ROW	Project	2		
161	116203	Roll Plot 2	Verizon	Rte 619	T			38+14 - 39+48	R	35' - 18'	LF	135			No Conflict	ON ROW	Project	2		
162	116203	Roll Plot 2	AEP	Rte 619	P			38+20	R	34'	EA	1			No Conflict	OFF ROW	Project	7		
163	116203	Roll Plot 2	Citizens	I-81 SB	T Ped			620+89	L	71'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
164	116203	Roll Plot 2	Citizens	I-81 SB	P			620+89	L	72'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
165	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		620+89 - 645+38	B	71'L - 14'R	LF	2492		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
166	116203	Roll Plot 2	City of Salem	I-81 NB	P			221+86	R	115'	EA	1			No Conflict	OFF ROW	Project	1		
167	116203	Roll Plot 2	VDOT	I-81 SB	FO			621+32 - 634+13	R	46' - 39'	LF	1281			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
168	116203	Roll Plot 2	City of Salem	I-81 NB	P			224+48	R	112'	EA	1			No Conflict	OFF ROW	Project	1		
169	116203	Roll Plot 2	Verizon	I-81 NB	T			225+86 - 225+91	R	165' - 112'	LF	53			No Conflict	OFF ROW	Project	7		
170	116203	Roll Plot 2	City of Salem	I-81 NB	P			225+94	R	108'	EA	1			No Conflict	OFF ROW	Project	1		
171	116203	Roll Plot 2	City of Salem	I-81 NB	P			227+22	R	109'	EA	1			No Conflict	OFF ROW	Project	1		
172	116203	Roll Plot 2	City of Salem	I-81 NB	P			228+46	R	112'	EA	1			No Conflict	OFF ROW	Project	1		
173	116203	Roll Plot 2	City of Salem	I-81 NB	P			229+81	R	112'	EA	1			No Conflict	OFF ROW	Project	1		
174	116203	Roll Plot 2	City of Salem	I-81 NB	P			230+53	R	118'	EA	1			No Conflict	OFF ROW	Project	1		
175	116203	Roll Plot 2	City of Salem	I-81 NB	E			231+72 - 231+75	R	170' - 129'	LF	42			No Conflict	OFF ROW	Project	1		
176	116203	Roll Plot 2	City of Salem	I-81 NB	P			231+75	R	129'	EA	1			No Conflict	OFF ROW	Project	1		
177	116203	Roll Plot 2	City of Salem	I-81 NB	P			232+88	R	138'	EA	1			No Conflict	OFF ROW	Project	1		
178	116203	Roll Plot 2	VDOT	I-81 SB	FO			634+13 - 645+74	R	39' - 39'	LF	1162			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
179	116203	Roll Plot 2	City of Salem	I-81 NB	P			235+37	R	137'	EA	1			No Conflict	OFF ROW	Project	1		
180	116203	Roll Plot 2	City of Salem	I-81 SB	W	8"		641+85 - 644+18	B	237'R - 185'L	LF	505		Sta 642+34 possible conflict with proposed storm sewer drop inlet	Possible Conflict	ON ROW	Project	1	IN-PLAN	
181	116203	Roll Plot 2	City of Salem	I-81 SB	W	8"		641+88 - 644+86	R	182' - 194'	LF	300			No Conflict	ON ROW	Project	1		

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182	116203	Roll Plot 2	City of Salem	I-81 SB	W	8"		643+34 - 644+68	B	85'R - 182'L	LF	298		Unknown if two water main existing or just one. Online GIS shows one water main in easement.	Possible Conflict	ON ROW	Project	1	IN-PLAN	
183	116203	Roll Plot 2	AEP	I-81 SB	P			644+44	R	204'	EA	1			No Conflict	ON ROW	Project	2		
184	116203	Roll Plot 2	Verizon	I-81 SB	T Ped			644+47	R	204'	EA	1			No Conflict	ON ROW	Project	2		
185	116203	Roll Plot 2	AEP	I-81 SB	P			644+48	R	199'	EA	1			No Conflict	ON ROW	Project	2		
186	116203	Roll Plot 2	Verizon	I-81 SB	T			644+47 - 644+67	R	204' - 238'	LF	53			No Conflict	ON ROW	Project	2		
187	116203	Roll Plot 2	Verizon	I-81 SB	FO			644+47 - 646+42	B	204'R - 125'L	LF	385			No Conflict	ON ROW	Project	2		
188	116203	Roll Plot 2	Verizon	I-81 SB	T			644+47 - 646+67	B	204'R - 185'L	LF	452			No Conflict	ON ROW	Project	2		
189	116203	Roll Plot 2	AEP	I-81 SB	P			644+68	R	235'	EA	1			No Conflict	ON ROW	Project	2		
190	116203	Roll Plot 2	City of Salem	I-81 SB	W	8"		644+60 - 647+00	B	238'R - 177'L	LF	480			No Conflict	ON ROW	Project	1		
191	116203	Roll Plot 2	Verizon	I-81 SB	T Ped			646+42	L	125'	EA	1			No Conflict	ON ROW	Project	2		
192	116203	Roll Plot 2	Verizon	I-81 SB	T Ped			646+65	L	185'	EA	1			No Conflict	ON ROW	Project	2		
193	116203	Roll Plot 2	AEP	I-81 SB	P			646+66	L	186'	EA	1			No Conflict	OFF ROW	Project	7		
194	116203	Roll Plot 2	Verizon	I-81 SB	FO			646+42 - 646+89	L	125' - 92'	LF	58			No Conflict	ON ROW	Project	2		
195	116203	Roll Plot 2	Zayo	I-81 SB	FO			646+66 - 646+78	L	186' - 95'	LF	105			No Conflict	ON ROW	Project	2		
196	116203	Roll Plot 2	City of Salem	I-81 SB	E			646+80 - 647+39	L	86' - 128'	LF	75			No Conflict	ON ROW	Project	1		
197	116203	Roll Plot 2	City of Salem	I-81 SB	P			647+39	L	128'	EA	1			No Conflict	ON ROW	Project	1		
198	116203	Roll Plot 2	Verizon	I-81 SB	T			646+66 - 650+71	L	186' - 123'	LF	432			No Conflict	OFF ROW	Project	7		
199	116203	Roll Plot 2	Verizon	I-81 SB	T			646+89 - 650+71	L	92' - 123'	LF	406		2 parallel lines shown in plans	No Conflict	OFF ROW	Project	7		
200	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		645+38 - 645+83	R	14' - 13'	LF	46		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
201	116203	Roll Plot 2	VDOT	I-81 SB	FO			645+74 - 655+39	R	39' - 51'	LF	960			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
202	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		645+83 - 666+53	R	13' - 26'	LF	2081		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
203	116203	Roll Plot 2	Verizon	I-81 SB	T			650+71 - 650+80	L	123' - 165'	LF	44			No Conflict	OFF ROW	Project	7		
204	116203	Roll Plot 2	City of Salem	I-81 SB	E			650+82 - 652+18	L	164' - 121'	LF	190			No Conflict	OFF ROW	Project	1		
205	116203	Roll Plot 2	City of Salem	I-81 SB	E			650+86 - 652+18	L	164' - 121'	LF	184			No Conflict	OFF ROW	Project	1		
206	116203	Roll Plot 2	VDOT	I-81 SB	FO			655+39 - 666+41	R	51' - 42'	LF	1101			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
207	116203	Roll Plot 2	VDOT	I-81 SB	FO			666+41 - 677+60	R	42' - 41'	LF	1119			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
208	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		666+53 - 678+97	R	26' - 42'	LF	1245		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
209	116203	Roll Plot 2	Verizon	I-81 SB	P			670+19	L	96'	EA	1			No Conflict	OFF ROW	Project	7		
210	116203	Roll Plot 2	Verizon	I-81 SB	T			670+19 - 671+05	B	96'L - 181'R	LF	297			No Conflict	OFF ROW	Project	7		
211	116203	Roll Plot 2	VDOT	I-81 SB	FO			677+60 - 683+06	R	41' - 152'	LF	565			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
212	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		678+97 - 685+46	R	42' - 136'	LF	714		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.

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UTILITY MATRIX

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213	116203	Roll Plot 2	Roanoke Gas	Rte 311 RPD	G			2302+13 - 2304+23	R	88' - 126'	LF	282			No Conflict	OFF ROW	Project	7		
214	116203	Roll Plot 2	AEP	Rte 311 RPD	P			2303+16	R	46'	EA	1			No Conflict	ON ROW	Utility			
215	116203	Roll Plot 2	AEP	Rte 311 RPD	P			2302+30	R	62'	EA	1			No Conflict	ON ROW	Utility			
216	116203	Roll Plot 2	VDOT	Rte 311 LPD	E			2202+70	B	30'L - 17'R	LF	47			No Conflict	ON ROW	Project			
217	116203	Roll Plot 2	VDOT	Rte 311 LPD	E			2202+70 - 2205+21	R	17' - 95'	LF	222			No Conflict	ON ROW	Project			
218	116203	Roll Plot 2	VDOT	I-81 SB	FO			683+06 - 686+78	R	152' - 118'	LF	378			No Conflict	ON ROW	Project			
219	116203	Roll Plot 2	VDOT	I-81 SB	E			684+28 - 686+81	R	93' - 362'	LF	422			No Conflict	ON ROW	Project			
220	116203	Roll Plot 2	VDOT	I-81 SB	FO			684+18 - 686+78	R	94' - 118'	LF	271			No Conflict	ON ROW	Project			
221	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		685+46 - 686+85	R	136' - 132'	LF	155			No Conflict	ON ROW	Utility	9		
222	116203	Roll Plot 2	VDOT	I-81 SB	FO			686+78 - 686+85	R	118' - 132'	LF	16			No Conflict	ON ROW	Project			
223	116203	Roll Plot 2	WVWA	I-81 SB	S	8"		685+41 - 685+46	R	228' - 324'	LF	97			No Conflict	ON ROW	Project	4		
224	116203	Roll Plot 2	WVWA	I-81 SB	S	8"		685+41 - 685+62	R	228' - 146'	LF	84			No Conflict	ON ROW	Project	4		
225	116203	Roll Plot 2	WVWA	I-81 SB	S	8"		685+62 - 685+66	B	146'R - 139'L	LF	286			No Conflict	ON ROW	Project	4		
226	116203	Roll Plot 2	WVWA	I-81 SB	S	8"		685+54 - 685+66	L	212' - 139'	LF	73			No Conflict	ON ROW	Project	4		
227	116203	Roll Plot 2	WVWA	I-81 SB	S	8"		685+54 - 685+80	L	212' - 438'	LF	73			No Conflict	ON ROW	Project	4		
228	116203	Roll Plot 2	WVWA	I-81 SB	W	12"		685+55 - 686+68	B	272'R - 470'L	LF	759			No Conflict	ON ROW	Project	4		
229	116203	Roll Plot 2	VDOT	I-81 SB	E			685+14 - 686+25	L	238' - 423'	LF	243			No Conflict	ON ROW	Project			
230	116203	Roll Plot 2	VDOT	I-81 SB	E			686+16 - 686+19	R	252' - 195'	LF	57			No Conflict	ON ROW	Project			
231	116203	Roll Plot 2	City of Salem	I-81 SB	W	8"		686+24 - 686+30	R	248' - 176'	LF	73			No Conflict	ON ROW	Project	1		
232	116203	Roll Plot 2	City of Salem	I-81 SB	W	12"		686+30 - 692+71	R	176' - 177'	LF	642			No Conflict	ON ROW	Project	1		
233	116203	Roll Plot 2	Roanoke Gas	I-81 SB	G	3"		686+72 - 688+34	B	263'R - 388'L	LF	734			No Conflict	ON ROW	Project	2		
234	116203	Roll Plot 2	VDOT	I-81 SB	FO			686+78 - 686+82	B	118'R - 73'L	LF	192			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
235	116203	Roll Plot 2	VDOT	I-81 SB	FO			686+82 - 688+91	L	73' - 85'	LF	213			No Conflict	ON ROW	Project			
236	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		686+85 - 688+46	R	132' - 144'	LF	167			No Conflict	ON ROW	Utility	9		
237	116203	Roll Plot 2	Verizon	I-81 SB	P			688+26	R	246'	EA	1			No Conflict	OFF ROW	Project	7		
238	116203	Roll Plot 2	Verizon	I-81 SB	T			688+26 - 688+32	B	246'R - 195'L	LF	442			No Conflict	ON ROW	Project	2		
239	116203	Roll Plot 2	Verizon	I-81 SB	T			688+26 - 689+73	R	246' - 213'	LF	159			No Conflict	ON ROW	Project	2		
240	116203	Roll Plot 2	Citizens	I-81 SB	FO	1 - 240 Count		688+46 - 692+65	R	144' - 42'	LF	474		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
241	116203	Roll Plot 3	Citizens	I-81 SB	FO	1 - 240 Count		692+65 - 703+92	R	42' - 49'	LF	1125		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
242	116203	Roll Plot 3	City of Salem	I-81 SB	P			698+92	R	206'	EA	1			No Conflict	ON ROW	Project	1		
243	116203	Roll Plot 3	City of Salem	I-81 SB	P			701+26	R	205'	EA	1			No Conflict	ON ROW	Project	1		
244	116203	Roll Plot 3	VDOT	I-81 SB	FO			701+76	B	31'R - 40'L	LF	71			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
245	116203	Roll Plot 3	VDOT	I-81 SB	FO			701+76 - 702+00	L	40' - 191'	LF	153			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default

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Item #	Project UPC	PLAN SHEET	UTILITY COMPANY	ROADWAY CENTERLINE	TYPE OF FACILITY	SIZE	POLE NUMBER	STATIONS	LEFT, RIGHT, OR BOTH	OFFSETS FROM CENTERLINE	MEASUREMENT UNITS	QUANTITY	TEST HOLES	ADDITIONAL DESCRIPTIVE REMARKS	CONFLICT EVALUATION	ON ROW, OFF ROW, OR IN EASEMENT	COST RESPONSIBILITY	COST RESPONSIBILITY REASON CODE	IN-PLAN or OUT-of-PLAN RELOCATION WORK	DESCRIPTION OF MITIGATION MEASURES THAT D-B CAN PERFORM FOR UTILITY
246	116203	Roll Plot 3	VDOT	I-81 SB	FO			701+76 - 703+30	R	31' - 39'	LF	152			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
247	116203	Roll Plot 3	VDOT	I-81 SB	FO			703+30 - 703+94	R	39' - 44'	LF	62			In Conflict	ON ROW	Project	N/A	IN-PLAN	VDOT facilities are in-plan work items by default
248	116203	Roll Plot 3	City of Salem	I-81 SB	P			702+48	R	202'	EA	1			No Conflict	ON ROW	Project	1		
249	116203	Roll Plot 3	Citizens	I-81 SB	FO	1 - 240 Count		703+92 - 735+13	R	49' - 57'	LF	3117		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
250	116203	Roll Plot 3	City of Salem	I-81 SB	P			707+52	R	278'	EA	1			No Conflict	ON ROW	Project	1		
251	116203	Roll Plot 3	WVWA	I-81 SB	W			734+59 - 735+78	L	151' - 109'	LF	124			No Conflict	ON ROW	Project	4		
252	116203	Roll Plot 3	Roanoke Gas	I-81 SB	G	4"		735+30 - 737+30	L	151' - 69'	LF	213			No Conflict	ON ROW	Utility			
253	116203	Roll Plot 3	WVWA	I-81 SB	W	8"		735+55 - 736+66	L	151' - 70'	LF	144			No Conflict	ON ROW	Project	4		
254	116203	Roll Plot 3	WVWA	I-81 SB	W	2"		735+69 - 735+85	L	165' - 106'	LF	62			No Conflict	ON ROW	Project	4		
255	116203	Roll Plot 3	WVWA	I-81 SB	S	8"		735+91 - 736+88	L	140' - 53'	LF	127			No Conflict	ON ROW	Project	4		
256	116203	Roll Plot 3	WVWA	I-81 SB	W	12"		736+66 - 737+27	B	175'L - 184'R	LF	391			No Conflict	ON ROW	Project	4		
257	116203	Roll Plot 3	Citizens	I-81 SB	FO	1 - 240 Count		735+13 - 735+30	R	57' - 154'	LF	106		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
258	116203	Roll Plot 3	Citizens	I-81 SB	P			735+30	R	154'	EA	1		relocation needed due to adjacent conflicts needing relocations	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
259	116203	Roll Plot 3	Comcast	I-81 SB	CATV			737+07 - 737+08	B	149'L - 250'R	LF	399			No Conflict	ON ROW	Utility			
260	116203	Roll Plot 3	WVWA	I-81 SB	S	8"		736+80 - 736+83	L	103' - 177'	LF	74			No Conflict	ON ROW	Project	4		
261	116203	Roll Plot 3	WVWA	I-81 SB	S	8"		736+80 - 736+88	L	103' - 53'	LF	51			No Conflict	ON ROW	Project	4		
262	116203	Roll Plot 3	WVWA	I-81 SB	S	8"		736+88 - 737+31	B	53'L - 173'R	LF	228			No Conflict	ON ROW	Project	4		
263	116203	Roll Plot 3	WVWA	I-81 SB	S	8"		736+88 - 736+95	L	53' - 176'	LF	123			No Conflict	ON ROW	Project	4		
264	116203	Roll Plot 3	Verizon	I-81 SB	T			737+05 - 737+16	B	154'L - 259'R	LF	414			No Conflict	ON ROW	Utility			
265	116203	Roll Plot 3	Comcast	I-81 SB	CATV			737+05 - 737+16	B	154'L - 259'R	LF	417			No Conflict	ON ROW	Utility			
266	116203	Roll Plot 3	AEP	I-81 SB	E			737+14 - 737+25	B	154'L - 258'R	LF	413			No Conflict	ON ROW	Utility			
267	116203	Roll Plot 3	WVWA	I-81 SB	W	8"		736+69 - 737+26	L	73' - 60'	LF	58			No Conflict	ON ROW	Project	4		
268	116203	Roll Plot 3	WVWA	I-81 SB	W	8"		737+26 - 737+29	B	68'L - 144'R	LF	213			No Conflict	ON ROW	Project	4		
269	116203	Roll Plot 3	Roanoke Gas	I-81 SB	G	4"		736+90 - 737+30	L	176' - 69'	LF	137			No Conflict	ON ROW	Utility			
270	116203	Roll Plot 3	Roanoke Gas	I-81 SB	G	12"		737+53 - 737+62	B	110'L - 210'R	LF	321			No Conflict	ON ROW	Utility			
271	116203	Roll Plot 3	Roanoke Gas	I-81 SB	G	12"		737+57 - 748+75	L	120' - 124'	LF	1072			No Conflict	OFF ROW	Project	7		
272	116203	Roll Plot 3	City of Salem	I-81 SB	P			740+26	R	276'	EA	1			No Conflict	OFF ROW	Project	1		
273	116203	Roll Plot 3	City of Salem	I-81 SB	P			742+84	R	189'	EA	1			No Conflict	ON ROW	Project	1		
274	116203	Roll Plot 3	City of Salem	I-81 SB	P			742+86	R	219'	EA	1			No Conflict	OFF ROW	Project	1		
275	116203	Roll Plot 3	Citizens	I-81 SB	FO	1 - 240 Count		742+84 - 756+44	R	189' - 33'	LF	1492		In conflict with median roadway widening	In Conflict	ON ROW	Utility	9	OUT-of-PLAN	Utility is interested in a combined relocation with VDOT fibers. Traffic control, lay down areas, and equipment parking areas can be provided by Design-Builder.
276	116203	Roll Plot 3	City of Salem	I-81 SB	P			745+56	R	188'	EA	1			No Conflict	OFF ROW	Project	1		





**TAB 3**  
Proposal Schedule

























